

MAY, 1907.

Vol. LI. No. 351.

JOURNAL

OF THE

Royal United Service Institution.



PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL.

Editor - Captain H. GARBETT, R.N. (Retired),

To whom all communications should be addressed.

LONDON :

**The Royal United Service Institution,
WHITEHALL, S.W.**

Telegraphic Address : "RUSSATUS, LONDON."

Printed by J. J. KELIHER & CO., LIMITED, 32, New Bridge Street, E.C.,
and 33, King William Street, E.C

Sole Advertisement Contractor : Mr. C. GILBERT-WOOD, Dacre House, Arundel Street, Strand, London, W.C

All rights reserved.

Price Two Shillings.

SWAN SONNENSCHN & Co., Ltd

NEW CAMPAIGN SERIES.

Crown 8vo. 5s. net each.

VOL. I.
FROM SAARBRUCK TO PARIS. By Lieut.-Colonel Sisson Pratt. With 10 Sketches and Maps.

VOL. II
THE RUSSO-TURKISH CAMPAIGN, 1877. By Major F. Maurice, p.s.c. (The Sherwood Foresters) With 3 Maps.

VOL. III.
THE FREDERICKSBURG CAMPAIGN, 1861-64. By Major G. W. Redway. With Maps and Plans.

VOL. IV.
THE CAMPAIGN OF MAGENTA AND SOLFERINO, 1859. By Colonel Harold Wyllly, C.B. With Maps and Plans.

VOL. V.
THE WATERLOO CAMPAIGN. By Lieut.-Colonel Sisson Pratt. With Maps and Plans. (*Ready shortly.*)

VOL. VI.
THE CAMPAIGN IN BOHEMIA, 1866. By Lieut.-Colonel Glünicke. With numerous Maps and Plans. (*In the press.*)

A DICTIONARY OF BATTLES. By T. B. Harbottle, Author of "Dictionary of Quotations" (Classical), "Dictionary of Historical Allusions," etc. Small demy 8vo 7s 6d

IMPERIAL DEFENCE: PRINCIPLES AND PROBLEMS OF. By Lieut.-Colonel E. S. May, C.M.G., Royal Artillery, late Professor of Military Art and History at the Staff College. 8vo. 7s 6d net.

"Lieut.-Colonel May is as strongly convinced as the most ardent Army reformers that the Navy is, and always must be, predominant. His book states the case with considerable force, and in particular we commend to our readers the chapter entitled 'The Functions of an Army.'"—*Daily Mail.*

SWAN SONNENSCHN & CO., Ltd., 25, High Street, Bloomsbury, W.C.



KEYLESS LEVER WATCH,

swelled in all holes, guaranteed a perfect timekeeper, in shallow and smooth case, from which it can only be removed by raising winding catch and unscrewing from the front, thus rendering it both dust & air tight.

In Oxidised Steel Case ... £2 10s.
In Solid Silver Case ... £3 10s.
In 18-ct. Gold Case ... £12 0s.

WATCH LIST POST FREE.

The Goldsmiths & Silversmiths Company's NOTED "SERVICE" WATCH

Manufactured expressly for Military Campaigning, and used under Service Conditions in all parts of the World with complete success.

**Goldsmiths & Silversmiths
Company, Ltd.**

Hundreds of these Watches have been sold to Officers and others serving on Active Service, with excellent results.

UNSOLICITED TESTIMONIAL.

"Please put enclosed Watch in a Silver Case. The metal has, as you see, rusted considerably, but I am not surprised, as I wore it continually on my wrist for three months and a half. It kept most excellent time and never failed me.—Yours truly,

"Capt. North Staffs. Regt."

THE
GOLDSMITHS & SILVERSMITHS COMPANY, LTD.

Watchmakers to the Admiralty.

112 & 110, REGENT STREET, LONDON, W.

TURKISH CIGARETTES.



RÉGIE DES TABACS
DE L'EMPIRE OTTOMAN.
CAPITAL - - - £4,000,000.
TURKISH RÉGIE CIGARETTES.

ALL HAND-MADE AT CONSTANTINOPLE.

UNEQUALLED FOR QUALITY, FLAVOUR, AND AROMA.

BY IMPERIAL CHARTER, the Régie have the exclusive right of Manufacturing and Selling Turkish Cigarettes in and out of the Ottoman Empire.

All Cigarettes bear the Imperial Ottoman Arms as a guarantee of genuineness.

Brands: SPECIAL, EN A'ALA, YAKA, NAZIR, SELAM.

Sold by all high-class Tobacconists at 3/6 to 11/- per 100.

Assorted Samples of Twelve Cigarettes will be sent post free upon receipt of Postal Order for 1s. by the

IMPERIAL OTTOMAN TOBACCO RÉGIE,
5, BEVIS MARKS, BISHOPSGATE, E.C.

Telegrams: "GIUBEK, LONDON."

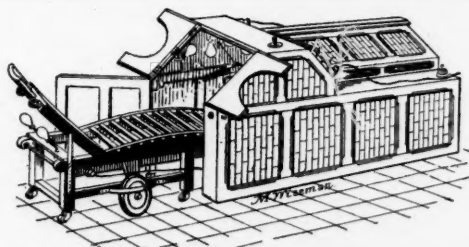
Telephone: No. 12523 CENTRAL

Telegraphic Address—

"RUSSATUS, LONDON."

CONTENTS FOR MAY, 1907.

	PAGE
1. THE GERMAN SECOND-CLASS PROTECTED CRUISER "HERTHA" ; 5,880 Tons ; 10,000-I.H.P. ; Speed, 18.5 Knots.	
2. SECRETARY'S NOTES	511
3. SECOND PRIZE ESSAY, 1906. Subject: "WHAT IS THE RELATIVE VALUE OF SPEED AND ARMAMENT, BOTH STRATEGICALLY AND TACTICALLY, IN A MODERN BATTLE-SHIP, AND HOW FAR SHOULD EITHER BE SACRIFICED TO THE OTHER IN THE IDEAL SHIP?" BY LIEUTENANT N. F. USBORNE, R.N.	513
4. THE SWISS MILITIA SYSTEM. LECTURE BY MAJOR R. A. JOHNSON. 1ST V.B. HAMPSHIRE REGIMENT, BRIGADE-MAJOR SOUTH MIDLAND VOLUNTEER INFANTRY BRIGADE	539
5. THE RUSSIAN SECRET SERVICE IN THE WAR OF 1904-5. TRANSLATED FROM THE "RUSKII INVALID." COMMUNICATED BY THE GENERAL STAFF, WAR OFFICE, 1907.	578
6. THE MILITARY RE-ORGANISATION OF CHINA. TRANSLATED BY PERMISSION OF THE FRENCH MINISTER OF WAR FROM THE "REVUE MILITAIRE DES ARMÉES ÉTRANGÈRES (continued)	588
7. THE BATTLE OFF TSU-SHIMA. IN MEMORY OF "THE SUVÓROFF," A PERPETUAL TRIBUTE TO FALLEN HEROES. BY COMMANDER VLADIMIR SEMENOFF, IMPERIAL RUSSIAN NAVY. TRANSLATED (WITH THE AUTHOR'S PERMISSION) BY LIEUT-COLONEL W. E. GOWAN, RETIRED LIST, INDIAN ARMY (continued)	595
8. NAVAL NOTES	602
9. MILITARY NOTES	620
10. NAVAL AND MILITARY CALENDAR FOR APRIL, 1907	640
11. CONTENTS OF FOREIGN JOURNALS FOR APRIL, 1907	640
12. NOTICES OF BOOKS... ..	647
13. PRINCIPAL ADDITIONS TO LIBRARY IN APRIL, 1907	649



1, YORK ST., JERMYN ST., S.W.

Mrs. WISEMAN,

ESTABLISHED IN LONDON, 1888.

**A Qualified Masseur attends,
and at Patients' Residences
by Appointment.**

*Patients treated under Medical
Supervision.*

ST. JAMES' ELECTRIC, LIGHT, & PINE BATHS

THE **HEALTH** OF THE **ARMY.**
THE HARTMANN STERILISER



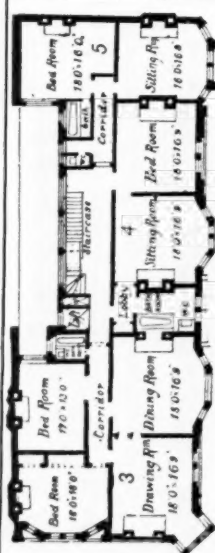
Renders WATER Infected
 with GERMS of

TYPHOID
DYSENTERY
CHOLERA

WHOLESOME.

An ILLUSTRATED BOOKLET dealing with the above and its application
 in the GERMAN ARMY sent free upon receipt of card to

LUDW. LOEWE & CO., LTD.,
30-2, Farringdon Road (opp. 109),
LONDON, E.C.



FIRST FLOOR PLAN

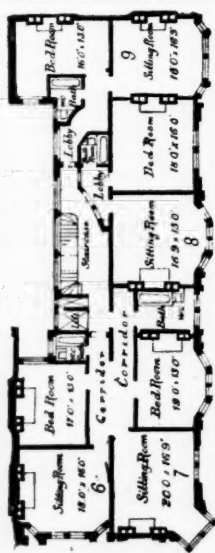
CATERING!
 (Excellent Cuisine.)



BURLINGTON MANSIONS,
23, CORK STREET, W.

BACHELORS' CHAMBERS,
 Furnished and Unfurnished,
TO LET.

VALETING and ATTENDANCE.
LIFTS.



SECOND FLOOR PLAN

[HOT WATER.
 (Continuous Supply.)

Apply :—THE STEWARD, on the Premises.

ROYAL UNITED SERVICE INSTITUTION.

PRESIDENT.

Field-Marshal H.R.H. The DUKE OF CONNAUGHT, K.G., &c.,
Inspector-General of the Forces.

VICE-PRESIDENTS.

Admiral Rt. Hon. Sir J. C. DALRYMPLE-HAY, Bart., G.C.B., D.C.L., F.R.S.
General Sir F. O. A. STEPHENSON, G.C.B., Constable of the Tower.
Lieut. Colonel T. H. BAYLI (K.C., M.A.), V.D., late 18th Middlesex V.R.C.
Field-Marshal the Viscount WOLSELEY, K.P., G.C.B., O.M., G.C.S.I., G.C.I.E., (1905).
Field-Marshal the Right Hon. the Earl ROBERTS, K.G., K.P., G.C.B., O.M., G.C.S.I., G.C.I.E. (1905).
Rear-Admiral H.S.H. Prince Louis of BATTENBERG, G.C.B., G.C.V.O., K.C.M.G., A.D.C. (1906).

CHAIRMAN.

Major-General Sir G. H. MARSHALL, K.C.B.

VICE-CHAIRMAN.

Admiral of the Fleet the Lord WALTER TALBOT KERR, G.C.B.

MEMBERS OF THE COUNCIL.

Lieut. Colonel W. BARTIE, V.C., O.M.G., M.B., R.A.M.C.
Major-General R. S. S. BADEN-POWELL, C.B., Inspector of Cavalry.
Colonel the Duke of BEDFORD, K.G., 3rd Bn. The Bedfordshire Regiment.
Colonel J. H. BOA, O.M.G., R.M.A., A.D.C., Extra Equerry to H.R.H. The Prince of Wales.
Commander W. P. CAMORSE, C.B., Royal Naval Reserve.
Colonel T. S. CAYE, Commanding South Midland Volunteer Brigade, late 1st V.B. Hampshire Regiment.
Colonel R. B. COLVIN, C.B., Essex Imperial Yeomanry.
Brigadier-General C. G. DONALD, C.B., Commanding Home Counties Grouped Regimental Districts.
Rear-Admiral A. M. FIELD, F.R.S., Hydrographer of the Navy.
Major-General Sir T. FRASER, K.C.B., C.M.G.
Colonel LONSDALE A. HALE, late K.E.
Admiral Sir R. H. HARDIS, K.C.B., K.C.M.G.
Colonel J. A. L. HALDANE, C.B., D.S.O., A.D.M.O., War Office.
Colonel W. A. HILL, C.B., late 3rd Bn. The Gloucestershire Regiment.
Lieut.-Colonel C. E. H. HOBHOUSE, M.P., 3rd V.B. The Gloucestershire Regiment (Under Secretary of State for India).

Colonel I. W. O. HORSLEY, V.D., 20th Middlesex V.R.C.
Major-General H. D. HUTCHINSON, C.S.I., Director of Staff Duties.
Colonel Honble. J. V. G. A. LUMLEY, half-pay, late 11th Hussars.
Lieutenant G. R. MALTBY, M.V.O., R.N. (retired).
Captain C. L. OTTLEY, M.V.O., R.N., Director of Naval Intelligence.
Brigadier-General Sir H. S. RAWLINSON, Bart., C.V.O., C.B., Commanding 2nd Infantry Brigade, Aldershot.
Captain E. J. W. SLADE, M.V.O., R.N., Captain of the Royal Naval College, Greenwich.

Secretary and Curator.

Lieut.-Colonel A. LEITHAM, Royal Monmouthshire Royal Engineers (Militia), late 13th Hussars.

Editor and Librarian.

Captain H. J. G. GARRETT, R.N. (retired).
Assistant Editor and Librarian
Major O. H. WILLY, late 1st Bn. South Staffordshire Regiment.

Assistant Secretary and Curator.

Lieutenant B. E. SARGEANT, 22nd Middlesex V.R.C.

Auditors.

Messrs. WILDE & FERGUSON DAVIE, Chartered Accountants, 63, FIVE STREET, E.C.

The undermentioned can become members by intimating their wish to the Secretary, and either forwarding to him their subscription, or giving him a written authority on their bankers or agents for its payments:—Commissioned officers of the Royal Navy, Regular Army, Royal Marines, Militia, Indian and Colonial Naval and Military Forces, Imperial Yeomanry, Royal Naval Reserve, Volunteer Corps, and Cadet Battalions and Corps, as published in the Official Navy and Army Lists, together with retired officers of the same whose names are retained in the Navy or Army Lists, and Naval Cadets, and Cadets of the Royal Military Academy, Woolwich, Royal Military College, Sandhurst, and Royal Military College, Kingston, Canada, on the recommendation of their commanding officers.

Officers retired from the various Services enumerated above, whose names do not appear in the Navy or Army Lists, are eligible for election by ballot on the recommendation, on personal knowledge, of two members of the Institution.

The terms of subscription are:—

Annual. £1 1s. 0d. entrance; and £1 1s. 0d. annual, payable on the 1st January each year.

Life. £15, payable in one sum.

Life. £15 15s., payable in three instalments of Five Guineas each; the first on joining the Institution, the others on the 1st January of each of the succeeding two years.

Members joining after the 1st October in any year are not called upon for any subscription the following year.

An extra payment of Ten Shillings entitles a member in the United Kingdom to the loan of Four Volumes at a time from the Library for a period of twelve months from the date of the subscription.

When a member desires to pay his subscription through his banker or agent, he should send to the Secretary a written authority as follows:—

To (Banker or Agents)

On receipt of this order please pay to Secretary, Royal United Service Institution, or order, my subscription to that Institution (according to the terms above).

Name in full.

Rank, Ship, or Regiment.

Address to which Journals and other communications should be sent.

The name of any member who fails to pay his annual subscription for two years is removed from the List of Members, but the member may be re-admitted as a new member on the usual terms.

Members of the United Service Institution of India on leave to the United Kingdom, and officers of the Colonial Naval and Military Forces who are temporarily in this country on duty, can become temporary members, and make use of the Institution on payment of Five Shillings per six months.

The Institution contains the best professional Library in the United Kingdom; an excellent collection of Maps and Charts; Reading and Smoking Rooms provided with the leading papers, periodicals, and writing materials; an interesting Museum; and a Theatre in which lectures upon professional subjects, followed by discussion, are frequently given.

The Journal, published monthly, is sent post free to all members. It contains the lectures given in the Theatre, articles on professional subjects, naval and military notes, book notices, &c.

Mr. E. Carlisle, M.A. (Cantab.) AND Major M. H. Gregson, late R.E.

Prepare Candidates for the Navy and all Army and Civil Service Examinations, at
5 & 7, LEXHAM GARDENS, KENSINGTON, W.

We have retained the services of all the Tutors who have been so remarkably successful in past years, and continue to receive both resident and non-resident candidates.

RECENT SUCCESSES INCLUDE— STAFF COLLEGE, AUGUST, 1906.

The following Officers, whose names are arranged in regimental order, were successful from us at the recent Competitive Examination for admission to the Staff College:—

Capt. C. Evans, R.F.A.	Capt. H. S. Williams, Dorsetshire Regt.
Capt. G. C. Merrick, D.S.O., R.G.A.	Capt. B. D. L. G. Anley, D.S.O., Essex Regt.
Capt. W. H. Moore, D.S.O., R.G.A.	Capt. R. S. Hamilton Grace, Durham L.I.
Capt. J. P. Mackesy, R.E.	*Capt. H. F. Baillie, Seaforth Highlanders.
Capt. B. W. B. Bowdler, R.E.	Capt. P. S. Allen, Gordon Highlanders.
Capt. F. D. Farquhar, D.S.O., Coldstream Gds.	Capt. J. K. Cochrane, Leinster Regt.
*Capt. R. G. Parker, Royal Lancaster Regt.	Capt. R. L. Ricketts, Indian Army.
Capt. G. N. T. Smyth-Osbourne, Devonshire R.	Capt. W. K. Bourne, Indian Army.
Capt. V. H. M. de la Fontaine, East Surrey R.	Capt. F. W. Lumsden, Royal Marine Artillery.
Capt. and Brev. Major F. R. Hicks, Hamps. R.	

And the following received nominations:—

Captain H. C. Bickford, 6th Dragoon Gds.	Captain H. Wake, D.S.O., K.R.R. Corps.
Captain C. J. C. Grant, Coldstream Gds.	Captain and Brev. Major N. J. G. Cameron,
Captain W. D. Wright, V.C., R.W. Surrey R.	Cameron Highlanders.
Captain C. H. Harrington, D.S.O., Liverpool R.	Captain G. P. Grant, D.S.O., Indian Army.

SANDHURST, JUNE, 1906.

FIRST ... A. G. Armstrong ... 5,541	129th ... R. P. T. French ... 3,827
48th ... H. G. Gauntlet ... 4,515	181st ... C. W. Molony ... 3,445
67th ... D. Macdonald ... 4,299	186th ... P. J. I. Synnott ... 3,386
89th ... W. G. Bagot-Chester ... 4,115	190th ... R. M. Aylmer ... 3,339
90th ... A. G. Ottley ... 4,109	197th ... O. Gough ... 3,262
93rd ... A. P. Williams-Freeman ... 4,091	201st ... P. W. J. A. Stomm ... 3,151
115th ... D. M. Black ... 3,940	213th ... B. W. Molony ... 2,881
125th ... W. J. King-King ... 3,846	

WOOLWICH, JUNE, 1906.

31st ... J. S. Barkworth ... 6,483

DECEMBER, 1905.

SECOND ... H. G. MacGeorge ... 7,196	16th ... B. Crofton ... 6,330
FOURTH ... G. Walton ... 7,046	45th ... D. Stephenson ... 5,899
FIFTH ... H. A. Cox ... 6,967	54th ... J. Kennedy ... 5,711

This was the First Examination under the new regulations, and our pupils secured THREE out of the first FIVE places.

MILITIA COMPETITIVE, MARCH, 1906.

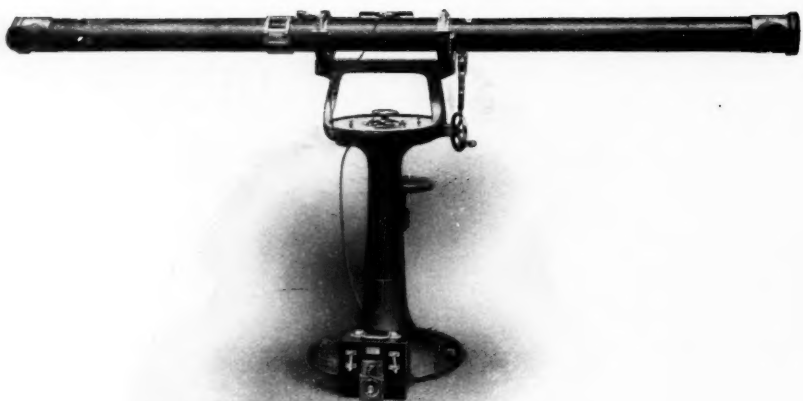
A. E. Hardy ... 2,304	W. F. Anderson ... 1,947
N. H. Hutcheson ... 2,105	D. C. Robinson ... 1,879
*F. D. Frost ... 1,949	F. A. Bowring ... 1,876

* Read partly at the Army College, Aldershot.

ARMY QUALIFYING, 1906.

NINETEEN PASSED FROM US.

Special Arrangements have been made for the next Examination.

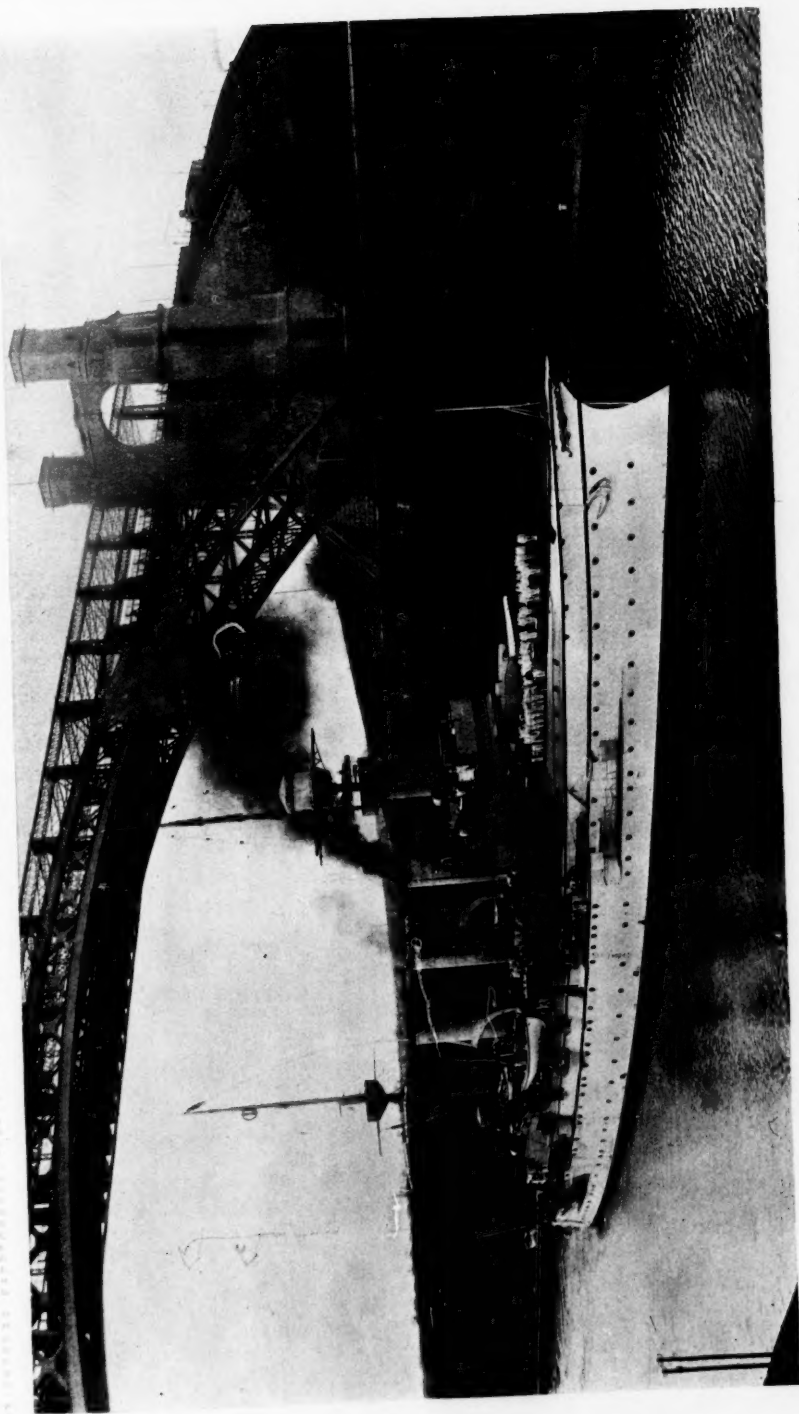


THE BARR AND STROUD FORTRESS RANGEFINDER.
9 FT. BASE.

Approximate uncertainty of observation :—
(Irrespective of the height of the instrument above sea level.)

1	yard	at	1,000	yards.
17	yards	at	4,000	"
85	"		10,000	"

BARR AND STROUD,
ANNIESLAND,
GLASGOW.



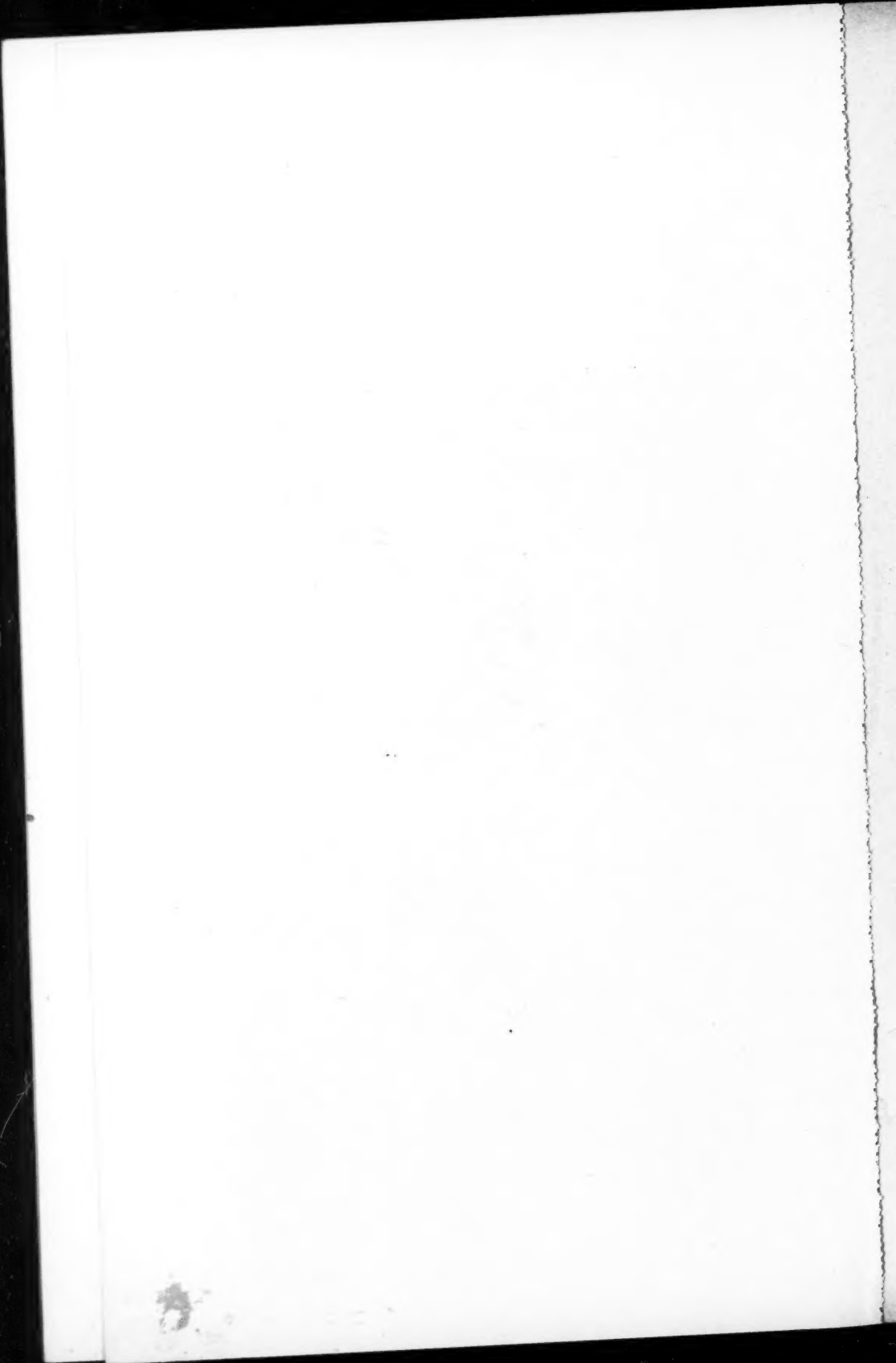
THE GERMAN SECOND-CLASS PROTECTED CRUISER "HERTHA"; 5,880 Tons; 10,000-I.H.P.; 18.5 Knots.

ARMAMENT:—Two 8.2-inch Krupp Q.F. guns in separate hooded berceuses; eight 5.9-inch 40-calibre Krupp Q.F. guns four in separate turrets and four in separate casemates; ten 3.4-inch 30-calibre Q.F. guns belittled shields, with 14 small machine guns and 3 submerged 18 inch torpedo-tubes, one in stern and one on each broadside.

PROTECTIONS:—Four-inch Krupp steel deck, tapering to 1.6-inch; cork belt at water-line, 250 feet long by 8 feet broad by 27 inches thick; Barbettes for 8.2-inch and 5.9-inch guns, 3.9-inch steel, with 4.7-inch casemates for 5.9-inch guns, 3.9-inch without and 3.1-inch within, with 3.1-inch ammunition hoists.

Funnel girders, 4.7-inch; forward conning tower, 5-inch, after conning tower, 3.9-inch.

J. J. K. & Co., Limited, London.



THE JOURNAL

OF THE

ROYAL UNITED SERVICE INSTITUTION.

VOL. LI.

MAY, 1907.

No. 351.

[Authors alone are responsible for the contents of their respective Papers].

SECRETARY'S NOTES.

1. JOURNAL INDEX.—An index to Subjects and names of Authors appearing in the JOURNAL from 1887 to 1906 (Vols. XXXI. to L.) has been compiled, and may be obtained at a cost of one shilling (inclusive of postage) on application, after 1st June, to the Secretary, Royal United Service Institution, Whitehall, S.W.

2. The following officers joined the Institution during the month of April :—

Lieutenant G. H. Impey, Royal Sussex Regiment.
Lieutenant B. Buxton, R.N.
Major J. A. C. Quilter, Grenadier Guards.
Captain C. E. Hollins, Lincolnshire Regiment.
Lieut.-Colonel E. W. Bone, 13th Middlesex V.R.C.
Captain A. G. N. Wood, Essex Regiment.
Lieutenant J. H. Pattisson, Essex Regiment.
Lieutenant G. T. Hamilton, R.F.A.
Second Lieutenant The Earl of Gifford, 1st Life Guards.
Lieutenant Hon. E. S. Wyndham, 1st Life Guards.
Lieutenant G. E. M. Mundy, 1st Life Guards.
Lieutenant C. P. Talbot, R.N.
Lieutenant W. T. McC. Caulfeild, R.E.
Captain H. S. Rogers, R.E.
Captain T. G. Matheson, Coldstream Guards.
Major G. F. Holland, late Royal Munster Fusiliers.
Commander W. R. Willis, R.N.
Lieutenant W. P. Crookshank, Indian Army.
Second Lieutenant F. G. Romanes, Lovat's Scouts, I.Y.
Lieutenant C. A. Bolton, Manchester Regiment.
Lieutenant C. W. McG. Compton, Indian Army.

(No officer of the Militia or Royal Naval Reserve joined the Institution during the month.)

3. REGIMENTAL COLOURS.—The Secretary is prepared to arrange for repairs to Regimental Colours and Cavalry Standards, in service or otherwise, at the Institution. A very large number has already been received during the past three years, and the repairs are executed at as small a cost as possible.

4. The Council are indebted to Mr. E. R. Mintz for the presentation of two manuscript volumes on the manufacture, etc., of gunpowder, to the Library. One is dated 1796 and the other 1811. They should be of interest to those concerned with the manufacture of explosives.

5. The following additions have been made to the Museum :—

- a. Four Coloured Prints, by Rowlandson, dated 1798, of London Volunteer Corps.
- b. A collection of Dervish Relics (including the Black Flag of the Khalifa), formerly the property of Major-General Sir W. F. Gatacre, K.C.B., D.S.O.

Given by The Honble. Lady Gatacre.

6. The gun recovered from the "Mary Rose" has lately been put together. The label, which should be of interest, reads as follows :—

"A breech-loading, wrought iron gun of the 15th century, recovered from the "Mary Rose," which foundered on July 20th, 1545. To load the gun the wooden wedge is removed, and access is thus given to the chamber, which is removed, loaded, replaced in the breech, and wedged up again before firing. The three pairs of rings were used both for moving the gun and for lashing it together when being fired. A spare chamber is lying alongside the exhibit.

"The earliest forms of cannon were open at both ends, and the breech was closed after loading by means of logs of wood pegged to the ground, or by a movable butt, or recoil piece, fitted to the carriage of the gun. The next pattern of gun was made so as to allow the fire-chamber to be entirely removed for loading, and this form was superseded by the ordinary muzzle-loading gun which was in general use until about the year 1860, when the breech-loading gun was re-introduced.

"The "Mary Rose," 60 guns, 500 tons, was built in 1509. In the year 1521 she was described as being one of the five largest ships in the Navy. Vice-Admiral Sir William Fitzwilliam, in describing the "Henry Grace à Dieu" to the King on June 4th, 1522, stated that she sailed as well, and rather better than, any ship in the Navy, weathering all but the "Mary Rose."

"On the occasion of the attack on Portsmouth in 1545, in moving out to meet the French fleet, the "Mary Rose," being very low in the water, heeled so much when her helm was put hard over that the sills of her open lower ports, only sixteen inches out of the water, were submerged. She quickly filled and sank, carrying with her her captain, Sir George Carew, and all hands with the exception of about 35 persons. The King and Lady Carew witnessed the disaster from the shore.

7. CHESNEY GOLD MEDAL.—The Council have awarded the Chesney Gold Medal to Major-General Sir J. F. Maurice, K.C.B., in consideration of his valuable contributions to Military Literature, more especially for his Wellington Prize Essay and his works "War" and "Hostilities without Declaration of War."

The only previous award of the Medal was made in 1900 to Captain A. T. Mahan, United States Navy.

SECOND PRIZE ESSAY.

By Lieutenant N. F. USBORNE, R.N.

Subject:—

"WHAT IS THE RELATIVE VALUE OF SPEED AND ARMAMENT, BOTH STRATEGICALLY AND TACTICALLY, IN A MODERN BATTLE-SHIP, AND HOW FAR SHOULD EITHER BE SACRIFICED TO THE OTHER IN THE IDEAL SHIP?"

Motto:—

"Strike! Strike Hard, and Strike Again!"

A PROBLEM concerned with two interdependent variables may be attacked in three ways: First, by pure mathematics. This requires a knowledge of the exact relation of the two variables, and as no such knowledge exists with reference to speed and armament, this method here fails.

Second, by "logical" examination. This has the merit of being more suitable for such a question as the present.

The third method is by constructive reasoning, based on first principles. It is aided by the second, which indicates the points at issue; it requires an intimate and accurate acquaintance with all the *data* that are known, and an absolute lack of bias on the part of the investigator.

The problem in question is:—

"What is the Relative Value of Speed and Armament, both Strategically and Tactically, in a Modern Battle-ship, and how far should either be Sacrificed to the other in the Ideal Ship?"

The British Navy is designed to fight its strongest and most probable opponent, and Germany appears to fill the rôle.

The factor governing our relative strength is the amount of money that each is prepared to spend. In the immediate future it may be roughly assumed for purposes of argument that England and Germany are prepared to spend in the ratio of 11 to 6. At present both nations have ships of the normal 18 knots speed and widely varying gun powers. In attacking this problem, the constructive method will first be used, and its results subsequently examined by the light of logic.

The one great factor is not weight, but COST.

What would it matter if a ship were of even 50,000 tons, provided she had speed and armament, and only cost a million pounds?

A PLEA FOR LARGE GUN POWER.

A ship must of necessity consist of a certain hull of weight and strength sufficient to withstand the strains of life at sea; she must further have her hull increased to bear the weight of adequate protection to her water-line and vitals; put in one gun only, and the ratio of her dead-weight to her useful power will be great. Increase the number of her guns, and the ratio grows continuously smaller. The most economical fighting machine is that in which this ratio is least.

Where and why is the limit reached?

One gun placed alone has an arc of 300° , which may be called an efficiency of 85 per cent. Mount another gun beside it, and this remains unaltered.

Place two turrets one at each end of the ship, and the efficiency of each will fall to 75 per cent. This is the universal practice in a modern ship; but then the plans diverge: turrets may be fitted either at the "corners" of a vessel, as in the "King Edward" class, or in the fore and aft line, as in the "Dreadnought."

Comparing these methods, the corner turrets have only an efficiency of 40 per cent., while that of the "Dreadnought's" middle turret is, roughly, 66 per cent. Now, this difference at first sight is nothing very great. The middle turret has the advantage of halving the weight, and the corner turrets seem to halve the chances of all guns being put out of action. Is this so?

FEW GUNS WELL PLACED.

When a ship is under fire, the shots strike evenly all over her hull. The day may be very near at hand when a spot is aimed at and that spot is hit; but at present the assumption may be made that one spot is as likely as another to be hit. If, therefore, the corner system offers twice as many targets as the fore and aft line plan, mathematically there is as much chance of two corner turrets both being knocked out of action as there is of one in the centre line.

Further, the $\frac{\text{weight}}{\text{power}}$ efficiency of the respective systems is clearly in the ratio of 4 to 6.6. It follows that in view of efficiency considerations alone, all the guns should be placed dead in the fore and aft line.

Tactically, this arrangement must be modified.

A ship must be able to fight ahead, to force an action, or to fight astern to escape a foe. In closing on an enemy, or being closed by him, it seems next to certain that one or other fleet will seek to postpone or avoid the fight, with the result that fire will be opened in the fore and aft line. Then not only does a heavier fire give some advantage at the time, but it may be the determining factor in the slowing up of one or more ships of the pursuers or pursued. Certainly, in a large ship the replacement of the "corners" by a midship turret means that instead of 6 ships, 7 can be built; but yet, though to dogmatise on such a point is idle, it seems beyond the reach of argu-

ment that any British admiral, who may be supposed to command a stronger fleet than the enemy, would far prefer the six ships to the seven. This fore and aft line fire is a tactical necessity, and even "guns-to-cost" efficiency must be sacrificed to gain this three times greater end-on fire.

The middle turrets might be placed *en échelon*; this effects the object, but introduces a reduced fire angle, which would seriously hamper an admiral in manœuvring his fleet. There remains only the system of two corner turrets. Each has an efficiency of 50 per cent; each can fire either ahead or astern. Both can be placed at a different level to the nearest turret, so that "blast" is obviated.

Thus these four turrets are an absolute necessity, namely, one forward, one aft, and two more "corners" on a different level to their nearest neighbour. These decided on, it only remains to increase the "weight to power" efficiency as far as possible by turrets in the midship line.

The "Dreadnought" has but one, with an efficiency of 66 per cent.

Can another one be added? A careful consideration of design suggests that it could not, because an extra turret in the midship line would most seriously affect the disposal of the engines and boilers, because in a ship of normal length there would positively not be room for the funnels, and because a further increase would considerably reduce the efficiency of all, not only by reason of the physically reduced arcs, but also on account of the larger margin of clearance that must be allowed for blast, the nearer guns are placed together.

Result: An armament of ten 12-inch guns, placed as in the "Dreadnought," offers the greatest ratio of useful gun power to weight and cost.

This seems a very lamentable answer. Ten 12-inch guns the limit, and there is but one escape, and that a doubtful one: a gun of greater size.

The problem of the speed is a separate one. Having obtained by all devices that science can suggest the greatest gun power for the money, it will still remain to settle what the speed should be. So many knots the more means so many ships the less; but the question of speed does not and cannot affect the other point of greatest fighting gun power per £ of hull to carry it.

Is the limit reached? Consider the question of the larger sum.

The object of using a larger gun is to be able to penetrate thicker armour at the same range as before, or the same armour at a greater range. Given greater speed, the ship with larger guns could then choose her own range at which she herself would be safe from a vital hit, while her opponent would not. Now, taking two guns of different sizes, at the particular range at which the smaller could just penetrate its own calibre of armour, the larger gun, having exactly the same velocity, could just penetrate its larger calibre. Or, in other words, at the range at which a 12-inch gun can pierce a 12-inch belt, a 13-inch could pierce 13 inches, and a 14-inch pierce 14 inches of armour.

This shows at a glance the relative capabilities of different sizes, bearing in mind that their muzzle velocities would actually be about the same, since in the 12-inch the maximum velocity consistent with a reasonably small erosion has been obtained, and that keeping the calibre constant and maintaining the same pressures the velocities would be the same. On leaving the muzzle, the projectiles lose

velocity, owing to air resistance, as some function of their radii. Since the energy stored in a projectile is also a function of the radius, the retardation due to air will be, roughly, the same for large projectiles as for larger ones having the same muzzle velocity, the exact variation being a matter of most intricate calculation. As to likelihood of hitting with guns of various sizes, the errors due to "whip" or "jump," and to "bad centering," which cannot at present be allowed for, are less the larger is the gun. It is a paradox established as absolutely certain that the larger the gun the less the jump; and in the case of bad centering the error also decreases steadily as the gun increases in length. Therefore, the chances of hitting are slightly greater with a large gun than with a smaller one.

The chances of penetration after hitting have been dealt with above.

Having penetrated, the damage will probably depend directly on the mass of the projectile. The size of the burster does not seem a very important factor; in fact, from actual experiment, it appears that the burster serves chiefly to break up the shell in the event of its hitting, but not striking armour sufficiently thick to break it up, the flying of the broken fragments being what causes the damage, even in a confined space, rather than the actual explosion. Thus "effect" considerations are all in favour of the bigger gun.

On the other hand, the charge required varies, for large guns, directly as the cube of the calibre, whereas the internal surface exposed to the heat increases only as the second power; in addition to this, the time taken to start the projectile obviously increases directly as the mass of the projectile and inversely as the square of the calibre. Thus the nett result is that the wear of the gun will increase as something like the $2\frac{1}{2}$ power of the calibre. This means that taking the life of a 12-inch gun as rather over 150 full charges, that of a 16-inch gun, for example, would be rather under 100. Though this might serve for war, the necessities of practice in peace time render such an increase almost out of the question. In addition to this, the cost per ton of gun increases enormously as the size of gun increases, mainly on account of the difficulty of doing such large work, with the result that a 16.25-inch gun, of twice the tonnage of the 12-inch, would cost at least four times as much. Even for a 13.5-inch special plant would have to be laid down; the gain in the ratio of gun power to hull cost would be considerable; but since all our probable opponents would be, not out-ranged, but out-penetrated, they would be compelled to follow our lead, and we should have indulged in a risky and useless experiment, jeopardising our pre-^{re-}position of superiority in type of guns over all, with the exception of, perhaps, the Americans.

But, it is always possible that an opponent will adopt this plan of increasing the effectiveness of the money he spends on his navy; should he do so, it would take a very considerable time to prepare our plans and plant, and catch up, during which time we should be at a disadvantage.

The conclusion is, that though we should not on any account lead the way in the undoubtedly effective, and eventually with sufficient experiment possible, race for larger guns. Yet we must have plans ready, cut and dried, for an immediate reply, in case anyone else should set the example.

In view of this conclusion, the 12-inch gun remains the weapon of to-day, and of the immediate future. Given the best guns, gun power may be measured in number of guns multiplied by the arcs over which they can fire.

The ship previously outlined has the maximum possible total, unless the ship be lengthened amidship by about 55 feet. The advisability of this will be discussed later; there is as much for it as against, and it appears better to let such growth be a matter of evolution rather than experiment.

Besides this 12-inch armament, only such guns are needed as are necessary for repelling torpedo attack. The "Dreadnought" has 26 12-pounders.

The new Japanese battle-ships have batteries of 4.7-inch guns.

For the English Navy, a new 4-inch gun has been designed of exceptionally high muzzle velocity, roughly 3,000 f.s., and flat trajectory; this may consequently be taken as the standard small gun of the immediate future.

Now the weight of a 4-inch gun, with its mounting, ammunition, spares and fittings, is only 13.5 tons, which is so small as to admit of carrying as many such as space will allow. Presumably, the 4-inch is adopted because the former number of 3-inch was insufficient, so that what has now been gained in power must not be lost in smaller numbers. Hence, 30 4-inch guns will form the Q.F. armament of the ideal ship. Now, to consider the tonnage of the ship as she stands, a ship of ten 12-inch, thirty 4-inch guns, and hull and armour to carry and protect them.

The weight of a turret containing two 12-inch guns, as fitted in our latest ships, is 610 tons, including the weight of the hood.

In addition, the weight of such turret armour as would not be there normally in the form of side or end armour varies slightly, but with the usual armour averages 300 tons. These figures are as calculated, and as used in designing, and are the actual weights of modern turrets.

Hence the total weight of 12-inch gun equipment comes to 4,550 tons.

Add to this the 4-inch guns at 13.5 tons apiece, or 405 in all, and the total armament reaches close on 5,000 tons.

To carry useful weight of guns or engines, a certain hull must be supplied. This hull must be of fairly definite dimensions, and be protected over certain well-known areas by armour of the standard thickness.

It follows that in the ships of any date, designed on certain standard lines of thought, there will be a definite relation between the weight of guns or engines, and the weight of hull and armour to carry them.

In the following statements, in view of the fact that armour is worn for the two distinct purposes of protecting the ship and protecting the guns, as much as serves to protect the guns alone, namely, 300 tons in the case of a two 12-inch turret, and 150 for a 9.2, has been transferred from the "Hull and Armour" total, to the weight totals of the guns concerned.

The above referred to ratio has been, of course, a growing one, as the principles of efficient use of gun weight have been evolved.

In the "King Edward" class, the guns, together with the amount of armour which would not be there except for them, weigh about 3,600 tons, and the propelling machinery about 1,300. This gives a ratio of 2.27 of hull and armour, coal, and equipment, to 1 of guns and propelling machinery.

In the "Dreadnought," where the very limit of efficient gun placing has been attained, for every ton of gun or engine there are 1.7 tons of hull or armour, or equipment.

Thus this first 5,000 tons of weight requires a further 8,500 tons of ship to bear it. The sum of these, or 13,500, is the tonnage of the speedless ship. Any further increase at first sight appears to be a sacrifice to speed.

But cost is the decisive factor. The relation of hull to armour being fairly standardised, the cost of "Hull and Armour" may be expressed with considerable accuracy in £ per ton, and in all our recent ships it averages £105 a ton.

Since sister-ships may differ from each other by fifty thousand pounds in cost, this average is as close to the truth as an average can be.

Using this multiple to the tonnage here obtained, the hull and armour cost £892,500; to this must be added the cost of the guns.

The cost of 12-inch turrets has been steadily rising, particularly of late, due to the great cost of nickel steel used in the guns.

It is made up of four factors, namely, cost of gun, cost of machinery, cost of armour, and cost of labour. In all these figures, the cost of labour is included in the charges quoted.

Thus, two 12-inch guns, of latest pattern ...	£20,000
Machinery of latest pattern turret for ditto. ...	34,000
Armour for this turret	34,650

Total	£88,650
Five times this amount is	443,250
Adding the cost of 30 4-inch guns, at 1,500 each ...	45,000

Total cost of armament is £488,250

Applying to this the cost of the hull and armour, namely 892,500

The total cost of the speedless fortress, carrying guns whose effective fighting power bears the very highest possible ratio to her cost, thus comes to the grand total of £1,380,750

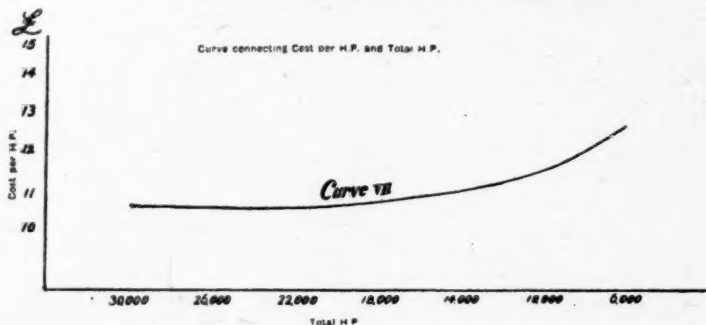
It only remains to constructively find the most convenient and efficient speed for weight and cost, to consider how the number of ships would be affected by a change of speed, or speed by a decrease of the above arranged-for guns, to compare the tactical and strategic values of speed and armament, and hence deduce the ideal ship.

Provided the lines of a ship be suitable to her length and tonnage, and to the speed at which she is intended to move, the horse power required to propel her at this speed will bear a certain definite ratio to her tons.

Taking all the battle-ships of the world, which have been built within ten years, and ascertaining the h.p. required to propel them at 17 knots, the following curve was plotted, showing the h.p. per ton required for any ship:—

knots, and multiplying by the tonnage of the ship it is desired to propel, the H.P. required is obtained at a glance.

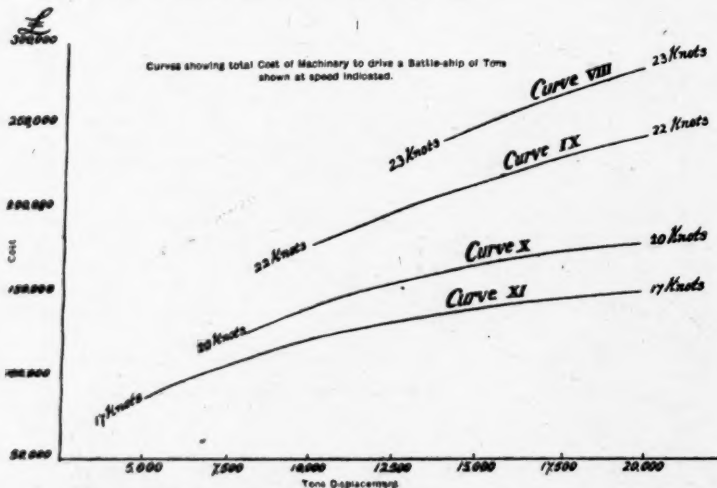
Now plotting a further curve showing the actual average cost of machinery of given horse-power supplied to battle-ships of recent years, the cost of any ship's machinery can be calculated.



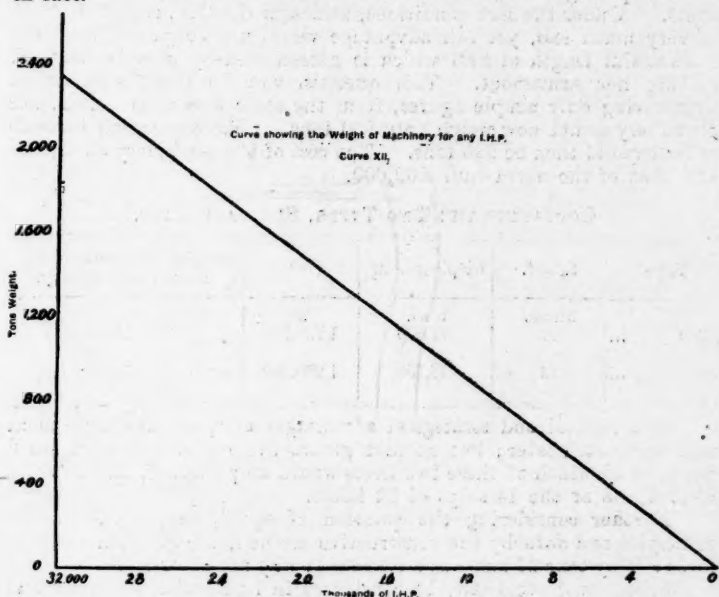
In order to simplify this operation, in the following curve the results of using the former curves in conjunction with each other have been plotted, and the cost of driving any ship at the speed named can be seen at a glance.

Turbine machinery is at present slightly more expensive; but in the course of a comparatively short time it appears certain to approximate to the cost of the older type, from which of course these data were obtained.

Since, moreover, the numbers, and therefore cost, of boilers for turbines and reciprocating engines are in the ratio of 50 to 74, owing to the more efficient use of the steam by the turbine, this curve correctly shows the actual cost at present and in the immediate future, within a very narrow margin of error.



As to weight, since the turbine has considerably reduced the weight required, and seems likely to be shortly universal, the following curve of weight and H.P. is for turbine machinery and Babcock and Wilcox standard boilers. These weights include uptakes, all the auxiliary engine fittings, water in the condensers—everything, in fact.



Taking arbitrarily a weight of machinery of 1,700 tons, because it gives round numbers in the total, the extra weight of hull and armour involved is 2,900 tons. Adding this and the actual 1,700 to the 13,500 tons of the speedless ship, the total displacement comes to 18,100.

Referring to the latest curve, the H.P. for this weight is 23,000, and referring this to curve No. IV., this gives our ship a speed of 22 knots. As to cost, the machinery cost has come to £235,000, and that of the extra hull to £304,500. This last can scarcely be considered as a fair allowance, for this reason: The ratio of 1·7 tons of dead-weight to a single ton of useful weight is true on the whole, but without actually designing a speedless ship in detail from start to finish it is quite impossible to state with certainty in what proportion the dead weight should really be divided between the guns and engines. The strength of hull is necessary mainly to withstand the shock of firing, and the armour mainly to protect the flotation of the ship. Probably the ratios would be roughly of the order:—

1 ton of guns requires 2·08 tons of hull and armour.

1 ton of engines requires .6 tons of hull.

Accepting this as the best available estimate, 2,000 tons of this extra hull and armour weight must be transferred to the account of the amended speedless battle-ship, as must also the sum of £210,000.

Summing up once more, the speedless battle-ship of the most efficient gun power is of 15,500 tons displacement, and costs no less than £1,590,750.

The weight of giving her a speed of 22 knots comes out to 2,600 tons, and costs £329,500—not a large cost in a ship of such dimensions.

Comparing her with what she would be if designed for only 17 knots. Under the slow conditions, although the H.P. required would be very much less, yet full advantage would not be gained from the most useful length of hull which is necessitated by considerations of spacing her armament. This question will be dealt with later. Considering only simple figures, from the same curves as before, her machinery would now weigh only 980 tons. The consequent increase of hull would then be 590 tons. The cost of the machinery £140,000, and that of the extra hull £62,000.

COMPARING THE TWO TYPES, SLOW AND FAST.

Type.	Speed.	Displacement.	Cost.	Numbers that could be built for the same money.
	knots.	tons.	£	
Slow ...	17	17,070	1,792,750	15
Fast ...	22	18,100	1,920,200	14

The tactical and strategical advantages of speed and armament will be treated later; but at first glance there does not seem much doubt as to which of these two fleets would be preferred, the 15 ships of 17 knots or the 14 ships of 22 knots.

Further considering the question of speed, starting from first principles and *data* by the constructive method, the question must be faced: Why take 22 knots as a standard; why not 25 or 20?

Speed must eventually be considered in its relation to tactics and strategy, and modified by these considerations; but from the constructors' point of view there are two leading marks to guide.

When designing the ship for the guns, the distance between the foremost and aftermost turrets cannot be increased without a large increase of armour weight and cost, and there would be no object in so increasing it. On the other hand, the distance can be and is decreased until, as in the "Dreadnought," a further decrease would result in such a decrease of the efficiency of the middle turret that from the gunfire point of view it would need to be replaced by two after corner turrets, with the attendant double cost and weight.

Thus the position of the turrets relatively to each other, and their distance apart, is fixed in the constructors' plans. The length and shape of the bow and stern are determined by the weights to be carried, and by quite other considerations, but as regards the space below the water-line between the fore and after turrets, when as much of it as is required has been allotted to the magazines and shell rooms, there still remain large spaces for the engines and the boilers. An over great speed would be limited and checked by the smallness of this space, since any increase of it requires the separation of the turrets, and the prolongation of the armour belt.

Fortunately, in practical designing it is unknown for a battle-ship's H.P. to be limited by space restriction. With reciprocating engines, sacrifices had often to be made to keep the engines low, but

as regards getting in the total power required, the difficulty did not occur.

Turbines occupy the same place as the older form of engine, but since the same boiler will now suffice for 74-H.P. as previously sufficed for only 50, owing to the more economical use of the steam, the space admits of power being put in up to considerably beyond the limit set by the length. This length limit will be dealt with later. On the other hand, having got a space and hull, and armour round that space, it may as well be filled with engines. The engine weight only requires a fuller form of bow and stern to give the buoyancy; it costs nothing at all in armour. It adds greatly to the steadiness of the ship. If this space were left nearly empty, difficulties would be met with in getting the weights low down; coal could not be used as ballast, as it is apt to be used up; guns would have to be brought lower down, at a sacrifice of fighting power in a seaway.

For example, suppose that the ideal ship under construction be provided with only 980 tons of machinery instead of 1,700 tons, the speeds being 17 and 22 knots respectively, the result may be gauged from considering what would happen to the "Dreadnought" if 720 tons of weight were removed from a position such that their centre of gravity was roughly 18 feet below the centre of gravity of the ship.

Either the ship would be hardly seaworthy, or some device would be found to compensate for this removal; most probably the very real sacrifice would never be noticed by any but the designers of the ship. Shortening all the turrets by a foot or two, using heavier fittings down below, or even introducing armour round the magazines, or extending the belt to a greater depth, some one or more of these devices would effectually hide the fact that the ship was doomed for ever to carry about with her 720 tons of dead-weight which, though perhaps employed in a cause which was introduced with a flourish of trumpets, had really only been paid for and placed in the ship to hide an instance of bad design. Of course, oil fuel might be carried in the double bottom to a weight of as many tons as at this depth would be required. But either this reserve supply would never be used, in which case it is still merely dead weight hiding under the *alias* of a "strategic requirement," or else it is used, in which case it has to be replaced continually by water to preserve stability. Obviously this water is mere dead weight, and obviously the oil fuel itself, even if eventually used is only dead weight while in the double bottoms.

Thus oil fuel cannot be used to compensate for the weight of machinery which is not put in. Coal the same, except that if used the stability would be lost, and that it cannot stow so low down. Hence, either deadweight must be carried in some form or other, or else the guns and freeboard lowered.

In fact, from this space consideration, it is clear that this space must be filled; and that it may be filled with more and more power, with ever-growing advantages of steadiness and height of command of guns, until some other determining and limiting condition comes into force.

This condition is the length of the ship.

Throughout the world it is a well known rule of thumb that to attain a speed with reasonable economy of weight and coal, the fraction $\frac{V^2}{\sqrt{L}}$ must be less than 1, where V is the speed in knots, and L the length in feet.

Taking some modern ships of good and bad designs, the following table shows how far they conform to this rough rule:—

Etruria...	...	Ratio = 0.87	Edgar ...	...	Ratio = 1.08
Teutonic	...	" 0.84	Drake ...	...	" 1.03
Campania	...	" 0.90	Monmouth	...	" 1.10
Deutschland	...	" 0.90	Pelorus	...	" 1.15
New Cunarders	...	" 0.895			

This rule is not an arbitrary one.

It is often said that horse-power must vary as the cube of the speed; few statements could be more erroneous. Horse-power may vary as anything between the second power and the fifth, or even far higher power, and the power according to which it varies depends greatly on the formation of waves by the ship in question. It is found that as a ship begins to approach that speed at which she forms a first wave equal in length to her own length, so the index with which the H.P. varies rises rapidly from 3 to roughly 5. As this critical speed is passed, the index falls again to roughly 3 for a short space. A curve follows which represents this index for the ship now under consideration being plotted to such a scale as to actually show the extra H.P. required at any particular speed to raise that speed by 1 knot.

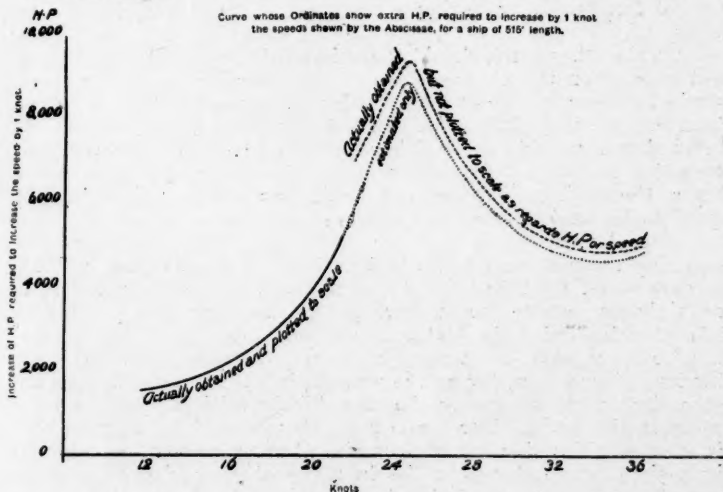
It is clear that for a given ship, supposing her to work at a speed that is opposite the high index part of the curve, an appalling price must be paid in horse-power. It might, perhaps, in certain cases where speed is an absolute necessity, be worth while to build in horse-power until the point of the curve is reached, where the index is once more reduced. Thus, in the case of a destroyer, this point is reached at 18 knots, and still more H.P. must be put in; but even then the price has still been paid for having disregarded the laws of wave resistance, and climbed the 4th and 5th power portion of the curve; besides this, in the effort of climbing this steepest portion the limit of space that is available without extending the distance between the turrets, and hence the length of the armour, would certainly be reached.

In a destroyer, with no magazines to speak of, no gun positions reaching down below the upper deck, and no armour belt to cost in weight and pounds, the space can be increased by the simple device of lengthening the ship, without encountering the fatal obstacles that hold in battle-ship construction. Hence, the speed is fixed by the length. The length between the foremost and aftermost turrets is fixed by the number of the turrets; allowing a rough guesswork estimate of a likely weight of boilers and of engines, the size and length of bow and stern are fixed by equations of displacement. Any small requirement of displacement can be filled by a very small change in shape of bow; but any change in horse-power must be met by an increased length with increased bow protection, which means an increase of length over and above that required by the right design for which the ratio of tons of hull to tons of machinery power was obtained. Any further increase of horse-power beyond that which is required to give the ship the speed which is just short of the critical part of the curve can thus only be obtained either by working on the steep part of the curve, which is absolutely out of the question for a ship efficient as regards value for money, or by

altering the curve by altering the length, by paying an enormous sum for increased bow and stern, and offering a very much increased target to the enemy.

Should it be decided on to have a ship of 30 knots, or thereabouts, the scheme of guns would have to be designed afresh, and the foregoing arguments repeated. To determine the speed of the ideal ship, in view of constructional considerations alone, it only remains to examine this curve for a ship of 510 feet in length, this being about the length required in this ship of 10 12-inch for spacing and displacement.

The following curve shows the results obtained with the "Drake," and, therefore, to be expected from a well-designed ship of about the same length, at speeds of from 12 knots up to 22. This part is shown in black. Beyond this the curve is only dotted, since no data exist, or can exist, for much higher speeds. The Abscissae represent certain speeds, and the Ordinates represent the amount of horsepower that has to be added in order to raise that speed by one knot. In order to obtain some guide as to how the dotted black curve should go, data for a destroyer, which passes the critical point of the curve at about 18 knots, have been plotted as a red curve. This red curve is not to scale; both the scales of speed and H.P. would need to be multiplied by certain constants, in order to read correctly, but these constants have no bearing whatever on the value of this red curve as a guide as to how the black curve would go if the attempt were made to largely increase the speed of a ship of only just over 500 feet length.



It is seen at a glance that only two courses are reasonable: either a ship must be given a speed well short of the critical point of her particular curve, or else, as in the extreme case of a destroyer, this point must be passed by a great deal. As before explained, the latter course is out of the question for a battle-ship; and, in view of the preceding investigations as to weight and cost, and the value of machinery weight, referring to the above curve it is evident that

this ideal battle-ship should have a speed of somewhere about 22 knots. The speed and armament of the ideal ship having thus been arrived at by a process of constructive reasoning, it only remains to examine their value by the light of logic, in tactical and strategical operations.

The strategic and tactical value of speed and gun power.

The boundary line between strategy and tactics is rather hard to fix; no matter, between them, these two cover the whole art of war, and its division into watertight compartments is as unnecessary as it is impossible.

An art must necessarily be one and indivisible, but, bearing this in mind, there is no reason why the popular method of considering the art in two broad phases should not be adopted, just as the grouping, or strategy, and the colouring, or tactics of a picture, are often criticised apart.

So for purposes of this examination, let "Tactics" be held to cover all operations while the battle fleets are actually firing, and "Strategy" the happenings before and afterwards.

Assuming a definite war, namely, a war with Germany, as the best theme from which lessons can be drawn, this war may commence either deliberately, or by surprise attacks from one side or the other. Suppose a surprise attack by ourselves—and it is greatly to be hoped that this is a more probable occurrence than one upon ourselves—discovery of our intentions, and of the existence of the state of war, can only be a matter of hours, of which probably three can be saved in an area such as the North Sea, a rectangle, roughly, 600 feet long by 400 feet broad, by having a sea speed of 20 instead of only 17 knots.

On the other hand, should the enemy deliver the surprise, results will depend on the circumstances of the case; but probably speed would be the only hope of salvation for an unprepared fleet attacked from the direction of its home. In this connection it must be remembered that even when fleets sight at a distance of, say, fifteen miles, supposing the fast but unprepared fleet to have only steam for twelve knots, the closing in of the enemy will take sufficient time for full speed to be attained, and an unwished-for action avoided.

But, leaving apart these somewhat unlikely hypotheses, and assuming a war to start normally from both sides, a navy, if divided, as ours would most probably be, into two or more fleets, can most certainly concentrate the quicker, and be the sooner in a position to take offensive action the higher is its speed. Germany, like France, has for many years been a torpedo Power. Germany is slowly changing its policy to ours, but at the present time her torpedo flotillas are generally known as among the most highly efficient and the most ready in the world. Her battle fleet, though weak in numbers and in class of ships, is most efficient also; but at present, and in the immediate future, her hope lies in the weakening of our forces by torpedo onslaught, or in their separation by some well-devised stratagem, preparatory to the battle action, which is inevitable, if she hopes to finally gain command of the sea for long enough to carry out an invasion.

Supposing that she takes the sea at once with all her ships; it remains for the British fleet to avoid torpedo attack, and yet to strike at the enemy. Now, if such operations were taking place in the broad Atlantic, a merely nominal superiority of speed would suffice

for the pursuers to at last catch up the foe, especially as, given long enough, one ship at least is morally certain to lose her speed, either temporarily or permanently. To the pursuer this means little, but to the pursued it means the deliberate sacrifice of a ship, or the consenting to an action to protect her.

Now, suppose the sea which is the scene of operations to be of smaller dimensions than before considered; the superiority of speed which sufficed with days of chase ahead no longer serves; from a point in the middle of the North Sea the German fleet has only fifteen hours' steam to reach its harbours. Supposing battle fleets to fix each other's positions, when even 45 miles apart, this means failure to force an action unless the speed superiority is greater than 3 knots. But there is a far more powerful argument for speed for a fleet so situated as our own; a retreating enemy is in the best position to deliver a successful night attack.

In the narrow waters off our eastern coasts the retreating fleet would be leading us towards his own flotillas and be steaming away from ours. Their flotillas would attack from ahead with the sum of the speeds; ours from astern with the difference. Their flotillas could therefore choose the time of striking with, for torpedo craft, comparative exactitude; ours could not. Every mile that the pursuit lasts directly increases the chance of passing over hostile submarines. In fact, for a fleet which means to win, operating in the North Sea, where distances are short, sheltered shores are close, the sea is usually fairly smooth, and the enemy's flotillas are world-renowned for their efficiency and dash, speed is not only desirable, it is absolutely vital. Should a pursuit have been undertaken by day, and an action not forced by nightfall, with only 17 knots the fleet would be in striking distance of a 24-knot flotilla even 70 miles away. With 22 knots as the speed of retiring, the flotilla must be within, roughly, 20 miles at nightfall.

Also, in case the attack comes off, the chances of success depend inversely on the time the boats are under fire, that is on the difference of the speeds. For in this connection, where the enemy have all they can do to find and catch the evading fleet, such torpedo tactics as encircling and attacking from ahead are difficult of performance.

Of course, the British fleet will not always, or often, attempt evading an attack by the simple device of running away; an alteration of course, with efficient protection by cruisers and destroyers, will certainly be more in keeping with offensive warfare and the attacking of the enemy on the morrow. Here again it is speed alone that enables the evading battle fleet to increase the distance which has got to be searched by night before an attack can be carried out, and when the daylight comes, it is speed alone that will enable an action to be forced that day. If the enemy had any real intention of striking a torpedo blow he would certainly wish to finish off his work with battle-ships next day, and will not have spent the night in running home; but unless the same sequence of operations is to be repeated, with the result of another night of risk, the superior fleet must have speed to enable them to use that force. The advantage in torpedo work must from first principles always rest with the retreating force, and only speed can minimise it.

If both fleets are strategically well handled, the weaker fleet will not allow itself to be caught, but will be driven into its own ports, when the modern version of the old blockade must be commenced,

It may be, however, that the enemy will desire an engagement. Even so, though we ourselves desire it, there would be no excuse for throwing away the advantages which fortune now has given; the torpedo warfare now is all in our favour. A fast fleet retreating can always baffle the pursuer. To fix the pursuer's position a cruiser has perhaps an hour's steam to do, and then wireless telegraphy conveys her information, whereas to fix the course and speed of the pursued, a hostile cruiser may need very many hours. Since this fixing of position is the prime necessity for a night attack, a fast fleet in retreat has even more advantages than has a slow one in the same conditions.

So at last, when all that is possible has been done to gain an advantage by torpedo warfare with the object of making more complete the victory of the battle fleet, either an action will be fought, or the enemy will be driven to his ports and the blockade begun. It can never be England that is blockaded; if the English fleet has once to fly for shelter because the enemy by some means or another has definitely become too strong to face, invasion is only a matter of days or weeks. Consequently it is England that has to consider the problems of blockade, and the bearing on them of this problem of speed.

In order to preserve as far as possible the sequence of thought, however, the tactical aspects of speed and armament, as illustrated by the battle which may be supposed to have preceded the blockade, will next be dealt with.

THE TACTICAL VALUE OF SPEED AND ARMAMENT.

If two fleets, a fast fleet and a slow one, are both equally well handled by infallible admirals, armament alone will determine the result of the action, armament being measured not merely by number of guns, but by the number that will bear on the enemy. This question of the arcs of training has a considerable bearing on the tactics that will be pursued, and also on the value of speed in action. But, assuming fleets similar in every way, and both perfectly handled, it will be found that the possession by one fleet of a superiority of speed gives no advantage whatever during the greater part of the action; yet, even under these abnormal conditions of perfect manœuvring, as the action is drawing to a close, due to the knocking out of one or other fleet by superior gunnery, speed will make it possible for the faster fleet, if victorious, to place itself between the enemy and the shelter of the ports to which they will want to run; or, if beaten, to escape with what is left of it to its own harbours for shelter and repair. Before considering the value of speed in a normal engagement with fallible commanders-in-chief, it cannot be too strongly emphasised that when an admiral at last finds himself defeated, without a chance of turning the tables, it becomes his natural duty to withdraw with as much as he can of the fleet entrusted to his care, rather than to sacrifice the whole force on which his country depends, simply because the fighting spirit is in him, and the feeling is common to everyone that it is better to die fighting than to live defeated. Consequently, the beaten fleet will always try to escape towards its home ports, either by single ships or in groups, or perhaps even still as a fleet.

The duty of the victor is to see that not a single ship escapes to give trouble on another day. If the faster fleet is victorious, it has no difficulty in preventing such an escape. If beaten, it at least has a fair chance of reaching port with some portion of its fighting force.

Hence, whatever be the value of speed in action, it is clear that a victory by a fast fleet over a slow one is likely to be decisive, whereas a victory by a slow fleet over a faster is likely to be indecisive.

No man has ever been born infallible, so that it may be assumed that mistakes will be made on at least one, probably both sides, in action.

It is claimed that speed enables a tactical mistake of one's own to be partially rectified, and full use to be made of a mistake on the opponent's part.

In spite of its unlimited variations and possibilities, an action may broadly be considered in three phases:—

1. In which the fleets are commencing to engage, and attempting to obtain a position of advantage. This phase often ends with both fleets steaming on parallel or concentric courses.
2. In which most of the actual fleet fighting takes place.
3. In which one fleet falls into disorder, and the other manoeuvres so as to profit by it.

FIRST PHASE.

Should one fleet have been seeking to avoid action, the time comes when this is seen to be impossible, and the retreat, as such, merges into tactical operations.

It becomes necessary to consider what constitutes a position of advantage, and to examine what axioms there are to serve as guides.

The following seem almost to be axioms:—

1. The fleets must be so placed that as many of one's own guns and as few of the enemy's as possible shall bear.
2. The fleets shall be placed so that as few of one's own ships and as many of the enemy's as possible are masked by each other.
3. The fleets should be so placed that the average distance of one's own ships from the nearest enemy is less than the average distance of the enemy from the nearest ship to them.

This last is the axiom which more than any other is brought into play. The ideal tactical position is that known as "crossing the T" as shown in the following diagram. It combines the demands of all three of the above axioms:—



Now the retreating fleet which is forced to give battle, will almost certainly be in, or get into, line abreast, and most probably this will be the position of her pursuer too.

Since the pursuer, if of nearly equal speed, by altering course at all, would drop, which she does not wish to do as it is incompatible with forcing an action; therefore, any move must first come from the pursued.

From now onwards the pursued and pursuers will be referred to as slow and fast fleets respectively.

Line abreast with the enemy astern is an advantageous position for several reasons:—The slow fleet suffers in the stern, which does not considerably affect speed; the fast fleet suffers in the bows, with consequent loss of speed. The fast fleet is more exposed to injury by torpedo than the slow fleet, etc.

Also, should the slow fleet desire another form of engagement, either because its stern fire is weak or for some other reason, since it is the first to alter course, the fact of its doing so will give it an advantage under axiom three. A glance at the following sketch shows that the fast fleet will very soon be able to nullify this advantage, thanks to its speed, and the action will have entered on the second phase.



But, during the time both are in line abreast, it is manifest that the fast fleet will be dissatisfied with its position. To change the nature of the action it must alter course, and the angle through which it can alter without losing on the enemy is the angle whose cosine is the ratio of the slow fleet's speed to that of the fast fleet, which, with fleets of 17 and 22 knots, comes to 39 degrees.

Looking at the following diagrams, it is clear that if the fast fleet alters 39° to starboard, and the slow fleet holds its course, the fast fleet will eventually pass through the position of maximum advantage, and arrive on the "Refuge" side of a beaten enemy.



Therefore, the slow fleet must alter course, and lose its advantageous position, and be no longer steaming nearer to its bases or torpedo craft. So, in this first phase, assuming the enemy to start in the most advantageous position, speed has enabled the faster fleet to obtain a position of equality.

It may sometimes be that the slow fleet will, of its own free will, give up the advantageous line-abreast-retreating formation, and begin the action straight away by steaming towards its enemy. In that case, the second phase begins at once.

SECOND PHASE.

From the foregoing it will be seen that, however, the action being commenced the time will arrive when the two fleets will be steaming on nearly opposite, nearly parallel, or nearly concentric courses, only excepting the case in which one fleet makes a radical error at the very commencement of the battle. This contention is borne out in almost every peacetime "Battle" that is fought, and in every "War Game" battle that is played. The battle of the Sea of Japan was a battle of concentric circles.

When so placed, speed obviously gives no particular advantage. It does allow the faster fleet to choose the range, subject only to the condition that if course be altered towards or away from the enemy by more than a certain amount, the fire of the after guns will be masked. But unless the slow fleet tries to prevent this alteration of range by itself altering course, such a large angle would not be required. Moreover, 3 minutes being the time allowed from the moment the fast fleet puts its helm over to the moment the other fleet does the same, having meanwhile observed the manœuvre, and made the necessary signal, the fast fleet will have opened out the range by 1,000 yards before the slow fleet steadies on the same course, without throwing any guns out of action.

It is evident that to further trace the possibilities of the action, once the fleets have changed their original "Parallel, opposite, or concentric," dispositions is next to impossible; it would, at least, require a longer and more elaborate treatment than the present. But normally, in view of the risks and difficulties of carrying out any manœuvre which is to lead to real success, it will probably occur that both fleets will continue in the Phase 2 positions, until one or other is seen to be most decidedly gaining the gunnery advantage. This fleet will then seek to keep the situation as it is, and the other fleet to change the position and try to restore the battle. Suppose it is the fast fleet that is suffering, it will obviously have no difficulty in getting out of range, preparing for another engagement, and then returning to the action with, perhaps, a better "Position of Advantage" than before. On the other hand, should it be the slow fleet that has need of a change, it cannot close the enemy, it cannot open out. If it retreats in line abreast, the original Phase 1 manœuvres are repeated, and it is once more forced into Phase 2. It cannot alter course in succession without giving the faster fleet the advantage under axioms 1 and 3, and possibly 2 as well. Thus the problem before a slow fleet which is getting the worst of it is a fairly hard one. All the possibilities of Phase 2 cannot be treated of in detail. But either the fast fleet is compelled to withdraw, beaten, and with probably an enormous loss of guns and life, and perhaps a loss of a ship or ships, or else the slow fleet falls into a worse and worse state. Fleet concentration of gunfire is a matter to which a good deal of consideration is given nowadays, since it is obvious that though slightly damaging all the enemy's ships is good work, yet, to concentrate on the leader of the line, or on the centre ship, may well so throw the line into confusion as to make the damaging of all the ships an easier task.

Thus, at length, the slow fleet begins to get disorganised, either by one ship throwing the line into confusion or colliding with another, or turning round in circles, or perhaps sometimes by the demoralisation

of all; then the battle enters on Phase 3. Before going on to this, it should be noticed that throughout the action each side is constantly on the look-out for any mistake on the part of the other, which will enable a position of decisive advantage to be gained. To consider individually all the mistakes which might be made, and the advantages to be gained, is again impossible here. But in every case the nature of the situation will be this: the enemy makes some move which has the result that if the other fleet can get to a certain position, relative to him before he has time to straighten his line, or to change his false position or formation to one more expedient, the desired advantage will have been obtained. Considering mathematically the factors on which success or failure depends, it will be clear that:—

If the speed of the fleet, which has made a mistake, be y , and the speed of the fleet which tries to take advantage be x , then the success of the attempt depends on the shortness of time required by the fleet of speed x to get to the required position, and on the distance which the fleet of speed y has been able to cover and employ in straightening the line or changing front during that time; but the distance this latter fleet has been able to cover depends on the time taken by the fleet of speed x , and on its own speed. Hence the chances of success vary directly as $\frac{x^2}{y}$. Similarly, the chances of the other fleet evading disaster vary directly as $\frac{y^2}{x}$. Hence, when either side makes a mistake, the chances of its being made use of, or being rectified successfully, vary directly $\frac{x^3}{x^3 + y^3}$ and $\frac{y^3}{y^3 + x^3}$ respectively, which, for usual speeds, is roughly the same thing as varying as the squares of the speeds, which is a most remarkable and important result.¹ The great majority of peace-time battles actually end in some such opportunity presenting itself and being successfully seized by the more skilful side.

A successful manœuvre of such a nature will speedily result in reducing the other fleet to a state of disorganisation such as is covered by Phase 3.

PHASE 3.

Under normal conditions, the fast fleet, if beaten, should never wait for Phase 3. It may be that considerations of national policy may make it necessary for a fleet of ours to, at some time, sacrifice itself against a superior enemy as a "forlorn hope," this has occurred before, though the forlorn hope has usually given a very good account of itself, and it may occur again. In this case, the generally accepted policy for the outnumbered and worsted fleet is to close the enemy, and try luck at close ranges with "gun, ram, and torpedo." On the face of it this is impossible for the slower fleet, though ships with a speed of some knots superiority might have some chance of success. Thus the fast fleet, if beaten, and if told off to fight to the last, has still one hope left to it. The slow fleet, if beaten, has none.

The fast but beaten fleet may now be considered to have either withdrawn, as ships, or as a fleet, or else to have risked all by coming

¹ For complete mathematical explanation, see Table 2.

into close quarters. It only remains to consider the case of the fast fleet "Victorious." That it can place itself between the enemy and his ports hardly needs demonstration. Should the enemy be fleeing in line abreast, the first phase tactics will suffice either to destroy him, or to force him off his course, and cut him off from home. Should he be in a disorganised and scattered group, the faster fleet has now no difficulty in acting according to circumstances and cutting off his retreat. The conclusion of the investigation of the three separate phases treated as a whole is this:—

Whatever the initial position, a fast fleet can force a slow one to engage on terms of equal advantage. It can force the slow fleet to alter course and steam away from home and help. The fast fleet can, at all times, choose the range. The fast fleet can always draw off and make a fresh start, and prevent the slow fleet doing so. If it gains the advantage, it can hold the enemy at the same range and in the same relative position; if the enemy gains the advantage, it can change the position of affairs, or retire altogether if desirable. During the action the chances of profiting by an enemy's mistake are as the squares of the speeds; the chances of rectifying an error are the same. When the battle is nearing an end, the fast fleet still has one last and considerable chance left, the slow fleet has none. Most important of all, the victory of the fast fleet is complete and decisive.

England bases her entire policy, naval, military, economic, and commercial, on the assumption, the axiom, in fact, that her fleet is going to win. Her only fear is, that a battle will be the one thing the enemy will avoid. If, then, England's belief is based on any solid grounds, if it really is a human certainty that if we fight we win, then let our fight be a decisive one. Whether 14 ships of 17 knots are better than 15 ships of 22 is merely an academic question. England confronts the enemy with a superiority, and it is a matter of comparative indifference whether she opposes 14 ships with 20 or with 21; but should she choose the 21, of only the same speed as the enemy, the price that will afterwards be paid in anxiety and ships and money, while the remnants are refitting, which her fear-inspired policy has forced her to let escape, will be a very heavy one.

A gun is a unit of fighting power, whose value is exactly known, and whose effect upon the enemy will be as the square of the relative numbers. For, if our fire be represented by x , and the enemy's by y , then our fire will be directly proportional to the number of our guns, and inversely to the heaviness of the enemy's fire upon us, that is as $\frac{x}{y}$.

Similarly, the enemy's fire will be as $\frac{y}{x}$.

Thus the ratio of the effects will be as x^2 to y^2 .

Thus the importance of gun fire cannot be over- or under-estimated. England intends to have more guns than the enemy by an ample margin, to make victory sure. Speed alone can enable the best use to be made of these guns, and make the victory decisive.

The enemy, being in his own ports, no matter from what cause, or in what state, it becomes necessary for the country to take such steps as will serve to bring about a peace satisfactory to ourselves. It is beyond the scope of this essay to consider what these steps might be, except that the rôle of the Navy will be affected to a considerable

degree by the general strategy of the war. Consequently, the probabilities of the situation must be superficially considered.

England's Army has only two courses open: to land in the enemy's country, or to stay at home. According to which of these two courses is chosen, the Navy will either be, to some extent, employed in assisting the Army directly, or in carrying out a modern blockade. For assisting an Army, high speed is of little value, since even a moderate speed gives a vastly higher speed of travel along a short piece of coast line than troops ashore can possibly possess; heavy guns of long range are required, and it seems probable that in general the older battle-ships would be employed for this purpose.

The other function of the Navy, the blockade of the hostile coasts, has for its object:—

1. The prevention of the escape into the open of any hostile ship.
2. The bringing to action of any hostile fleet that ventures out.
3. The destruction of the enemy's trade and wealth by the interruption of his sea-borne commerce.

Now, in the case of Germany, the first of these objects can be affected by holding the North Sea; but not the second or third; the enemy could manœuvre in the neighbourhood of Kiel until the state of efficiency of the fleet or the arrival of some suitable opportunity made another effort on his part judicious; his commerce could leave the Baltic ports in neutral ships, and he could carry on his trade almost as safely as before.

Evidently it would be highly desirable for our fleet to occupy the Baltic stupendous though the risks and difficulties entailed will be. Suppose a powerful squadron of armoured cruisers to occupy the Baltic, and a blockade to be declared. If the hostile battle-fleet steams north-east to the attack, in order to effect their object they will have to pursue to the furthest limits of the Baltic, and our own battle fleet has but to face the perils of entering that sea, quitting its normal sea base somewhere off the north-west of Denmark, to place itself between the enemy and the only ports which are sufficiently strongly fortified to offer him an adequate protection. Once the enemy has left his ports, all the earlier remarks on the value of speed and armament apply *de novo*. While wearily waiting for the desired opportunity, both speed and armament have only a potential value, except that speed enables the sea base to be situated at a greater and therefore safer distance than it otherwise could be. A sea base is assumed, not only because of the geographical situation under consideration, but because, from considerations of *morale*, it is probable that a fleet at sea is far more awake, on the *qui vive*, and spoiling for a fight than one that lies in harbour.

Should our Army land, the rôle of the Navy will be only slightly modified; the position of the base, and the distribution of linking ships would be largely influenced; but the general idea, and the potential nature of the value of speed and armament would be unchanged. In the case of Germany, many considerations serve to indicate fairly clearly what would be the point of attack at which the larger forces of the enemy's troops would have least advantage, and ours benefit most by their sea support. The neighbourhood "Hamburg, Bremen, Wilhelmshaven, Cuxhaven," presents all the most desirable features of extended sea coast, easy access from England,

and importance such as to compel the enemy to exert all his force in the effort to expel the invaders; it also promises at least a possibility of blocking the western entrance of the Canal, and of seizing the great "Free Town" of Hamburg. These, however, are scarcely naval questions, though they do affect the naval dispositions. The nett result of the investigation into the value of speed and armament in the operations of invasion or blockade is the conclusion that every argument that applied during the earlier phases of war applies now, and, in addition, the argument that speed enables, sometimes, a better base to be selected, while larger guns enable greater assistance, sometimes, to be given to an army.

The conclusion of the whole matter is, that speed and armament go hand in hand, and are mutually and almost exactly interdependent.

In strategy, speed is dominant, but is useless unless armament is co-existent, so as to enable the fruits of victory to be plucked which speed has brought within our reach. In tactics, armament is dominant, but is largely wasted unless speed is co-existent, so as to enable full use to be made of it, and the right and proper fruits of victory, namely, the utter and final annihilation of the enemy's fleet, to be gathered at the finish of the action.

The ideal ship has to catch the enemy, and then fight him; in this ship comprise is as unnecessary as it is undesirable. Ships for other purposes, cruisers, scouts, destroyers, these are compromises. But in the battle-ship, the highest achievement of naval constructional science, the combination is clear and simple, and settled by clear and simple rules. More gun power demands, necessitates, and facilitates more speed; the natural combination of the two in an ideal ship has been traced from first principles into the complete battle-ship; this ship has been considered at sea, and in action, and in the execution of all the duties she will be called upon to perform; she has shown herself equal to her task, which, for a ship which flies the English flag is simply this, to

"STRIKE! STRIKE HARD, AND STRIKE AGAIN!"

TABLE I.

KEY TO FIGURES ON CURVE I.

No.	Name.	No.	Name.
1	Great Britain.	21	Massena ... France.
2	Lord Nelson ... "	22	Carnot ... "
3	King Edward VII. ... "	23	Deutschland ... Germany.
4	Triumph ... "	24	Wittelsbach ... Austria.
5	London ... "	25	Erzherzog Karl ... "
6	Duncan ... "	26	Habsburg ... "
7	Canopus ... "	27	Wien ... Sweden.
8	Majestic ... "	28	Oscar II. ... "
9	Renown ... U.S.A.	29	Vasa ... "
10	South Carolina ... "	30	Dristigheten ... "
11	Kansas ... "	31	Thor ... Norway.
12	New Jersey ... "	32	Norge ... Denmark.
13	Idaho ... "	33	Olfert Eischer ... Holland.
14	Ohio ... "	34	Tromp ... Italy.
15	Alabama ... "	35	De Ruyter ... "
16	Kersage ... "	36	Napoli ... "
17	Oregon ... "	37	Regina Margherita ... "
18	Voltaire ... France.	38	Ammiraglio Di St. Bon "
20	Patrie ... "	39	
		40	

TABLE II.

A mathematical examination of the relation of speed to opportunity of utilising or rectifying a tactical mistake, and of the assumption that the equation so obtained might have substituted for it the ratio of the squares of the speeds of the two fleets.

Since a certain manœuvre, error of judgment, or degree of confusion, or of alteration of course, due to some accident, either does or does not make it possible for the enemy to gain a position, offering a certain definite degree of advantage, therefore, "the chances of making use of a given mistake" is an incorrect way of considering the problem.

For brevity sake, the word "error" shall mean any manœuvre or alteration of course, whether intentional or otherwise, and any disorganisation of ships or of the fleet, no matter to what cause it be due, which may possibly enable the enemy to gain an advantage if only he can get sufficiently quickly to the required position.

It must be considered that there are a large number of "errors," of which, so long as the speeds are equal, only half can be taken advantage of. On this basis, a mathematical investigation will show that where the enemy has a superior speed the number of errors of which he can take advantage has increased, or, in other words, he can take advantage of smaller pieces of good fortune, or bad management on the part of his opponent, than before.

A successful attainment of this position of definite standard amount of advantage requires the coincidence of three separate causes:—

1. The situation must be sufficiently favourable.
2. The time required to get to the required spot must be sufficiently short.
3. The distance that the enemy has been able to cover during this time, and employ in straightening his line, changing front, etc., must be sufficiently short.

If these three conditions are all satisfied, the attempt will succeed. Now the chances of each of these conditions being satisfied, are as follows:—

1. Let the chance be represented by k . Then also the chance of the situation not being sufficiently favourable will be $(1-k)$.
2. Chances vary as x , where x is the speed of the advantage-taking fleet.
3. The chances vary as $\frac{1}{\text{Distance Covered}}$, $= \frac{1}{y + \frac{1}{x}} = \frac{x}{y}$,

where y is the speed of the erring fleet.

Therefore, the chances of all three conditions being satisfied at any one time are as $K \times \frac{x^2}{y}$

Similarly, the chances of the necessary conditions being satisfied to allow the mistaken fleet to escape are as $(1-k) \frac{y^2}{x}$

Then, the number of errors capable of being taken advantage of is to the number not capable of being taken advantage of as:—

$$\begin{array}{rcl} \frac{x^2}{y} + k & : & \frac{y^2}{x} + (1-k) \\ x^3 k & : & y^3 (1-k) \\ k(x^3 + y^3) & : & y^3 \\ k & : & \frac{y^3}{x^3 + y^3} \end{array}$$

Now, by definition, given only equal speeds, advantage can just be taken of an error half way along the scale. To test the above obtained solution, put y equal to x .

Then $\frac{y^3}{x^3 + y^3} = \frac{1}{2}$, which shows the correctness of this expression for these speeds at least.

So long as these results had to be considered in their above rather complicated form, it was hard to form any idea of the value of the point proved.

Hence, the statement was made that the above obtained expression could be approximately represented by the ratio of the squares of the speeds.

The mathematical demonstration of this is as follows:—If $\frac{y^3}{x^3 + y^3}$ is to nearly $= \frac{1}{2} + \frac{y^2}{x^2}$, y and x must be nearly equal. And since with modern fleets, 5 knots is the very outside difference of speeds that can be expected, the speeds are sufficiently nearly equal at high speeds, and this complicated expression can be represented by the ratio of the squares of the two speeds. The actual physical meaning is still rather hard to understand, unless the countless incidents of a battle be ranged in a scale of importance. Perhaps the non-mathematical way of considering the effect of the results mathematically obtained is the best, namely, that the chances of utilising or rectifying any error are influenced in the ratio of the squares of the two speeds.

TABLE III.

Concerning the question of the advisability of increasing the length of the ship amidships, in order to admit of more turrets being mounted, and the ratio of gun power to dead weight being raised.

Taking a ship with turrets arranged as in the "Dreadnought," in order to insert another turret of diameter 29 feet in the fore and aft line, with an arc of training of 240 degrees, it would be necessary to lengthen the ship amidships by 60 feet. It is so, that this midship addition may be considered as just possessing the necessary buoyancy to counteract the increased weight. Consequently, the ship need only be lengthened by this 60 feet. As the ship is lengthened by the addition of one or more such turrets, the natural speed will also rise, as also, of course, the cost and displacement. The following table shows the length, tonnage, guns, and speed, as estimated from the data given during the course of this essay:—

Length.	Displacement.	Guns.		Natural Speed.
510	18,100	Ten	12-inch	22
570	21,100	Twelve	"	23.9
630	24,100	Fourteen	"	25.1
690	27,100	Sixteen	"	26.3
750	30,100	Eighteen	"	27.4
810	33,100	Twenty	"	28.5
870	36,100	Twenty-two	"	29.6

As to cost, a careful computation shows that the ratio of gun power to cost remains practically constant from a 10-gun ship upwards, whereas the ratio of speed to cost increases obviously. Consequently, the larger a battleship is, the more value is obtained for money. On the other hand, few existing docks are capable of accommodating such a ship as the last one on the list, and the cost of building such docks would be colossal. Hence, it appears better to allow such a growth, which seems bound to ultimately come, to be a gradual one, more especially since this policy of gradual growth allows of the British Navy always keeping well ahead of all possible opponents in the matter of speed, without, in any way, sacrificing gun power to this necessity.

THE SWISS MILITIA SYSTEM.

*By Major R. A. JOHNSON, 1st V.B. Hampshire Regiment,
Brigade-Major South Midland Volunteer Infantry Brigade.*

On Wednesday, 16th January, 1907, at 3 p.m.

The Right Hon. R. B. HALDANE, K.C., LL.D., M.P.,
Secretary of State for War, in the Chair.

The CHAIRMAN :—I propose to act more cautiously than chairmen sometimes do, and to make no observations until I have heard the lecture. I will only say to you that Major Johnson, who is a friend of mine, has given a great deal of study to this and cognate subjects, these subjects being the information and the instruction which is to be obtained by comparing other systems with our own. We are all of us very apt to see very clearly the strength of our own position, and, at the same time, to fail to appreciate the strength of somebody else's position. That is why I think we cannot give too much study to foreign systems, even although we cannot follow them, or find them inapt for our own purposes. The Swiss system is one which has peculiar reasons for commending it to our consideration; and, speaking for myself, I look forward with the keenest interest to the account which we shall hear of it from Major Johnson.

LECTURE.

WHEN the Council of the Royal United Service Institution did me the honour to invite me to address you this afternoon on the subject of the Swiss Militia system, they did not, of course, suppose that I should have anything to say that was new to my audience. The Swiss Militia system is perfectly well known to anyone who is interested in problems of National Defence, and there are many present in this hall who are far more conversant with its details than am I, who can only claim to have consulted such authorities as are accessible to any civilian, and to have been privileged as any Englishman, who may wish to do so, is privileged, to see the Swiss Army at its annual manœuvres. Even the photographic slides with which I propose to lighten the more tedious passages of my discourse are not original. The manœuvres which I attended were those held in September last in the neighbourhood of Zurich. The slides, which have been kindly lent me by my friend Colonel Edmonds, of the General Staff, were taken at the manœuvres of 1900.

I.—THE RELATION OF OUR AUXILIARY FORCES TO THE SWISS MILITIA SYSTEM.

Nevertheless, though they might well have chosen a better expositor, I think the Council have done well to provide us this afternoon with a "refresher course" on the Swiss Militia system. Our own Auxiliary Forces are based, so far as they are based upon systems at all, upon a Militia system. The Militia itself is recruited in times of peace by voluntary enlistment, while the theory which gave birth to the original Volunteers was that they volunteered for a duty for which they would otherwise have been liable in time of war under the Militia Ballot. If the theory of universal Militia service had no real place in our Statute Law, the Volunteers themselves, who from this point of view are merely Volunteer Militiamen, would have no constitutional *raison d'être* whatever. Now, it has been well said by the Military Correspondent of the *Times* that the most vital military question of the day here in England is that of the re-organisation of the Auxiliary Forces, and with this sentiment I make bold to say that the Secretary of State for War, who is our Chairman to-day, would be the first to concur. I need hardly remind him of his own words: "And now I come to what, to my mind, is our great problem of to-day—the so-called Auxiliary Forces. I have used that name, but I hate it. I believe in one National Army. . . . What is passing through my mind is that the time has come to take our Militia and Volunteer Forces far more seriously than they have been taken up to the present. The problem of to-day is not a problem of the Regular Forces, nearly so much as a problem of a Nation in Arms, of the people as a whole, with all the forces of the Nation welded into one entirety.—Speech at Newcastle, 14th September, 1906

THE NEED FOR REORGANISATION.

This welding process means a considerable reorganisation of the chaos of small units of varying conditions of service, and even more varying military value. The conditions of training and of service in what we know to-day as the Militia have outlived the circumstances of the times which gave them birth. The Volunteers, whose conditions of training and service—in so far as these have been framed by themselves and not by the War Office—far more nearly approximate to the exigencies of our modern social and industrial life, "have been allowed to grow up, like mushrooms, haphazard."

Their distribution, numerical and geographical, and the proportion in which the various arms of the force are maintained, have never been based on purely military considerations. For this the Volunteers themselves are not to blame; their numbers, which is the good part about them, are the outcome of patriotism; their distribution and their utter lack of organisation as a military force are the result of nearly 50 years of administrative neglect. Perhaps this neglect has had some advantages. It is doubtful, for instance, whether a stricter official surveillance would ever have suffered the Volunteers to gain adolescence at all. But it has also had considerable disadvantages, and a more careful adaptation of our Militia system to the changing circumstances of the times would not now have placed us in the unfortunate position of having two

Reserve Forces existing side by side, each to a great extent stunting the development of the other. The time has now come for a complete reorganisation of our Second Line Army, and there is every reason to believe that the foundations of such a reorganisation are to be laid in this present year of grace.

It is this coming reorganisation of our Second Line Army which lends so great an interest to the Swiss Militia system, and it is my intention this afternoon to recall to your minds some of the outstanding similarities between the problem that confronts the free citizens of the Swiss Republic and those with which a democratic British Statesman is now called upon to deal. In our examination of the solution which the Swiss people have found for their problem I think we shall find a considerable deal of guidance for the solution of our own.

OUR MILITIA SYSTEM HAS NOT BEEN KEPT UP-TO-DATE.

THE SWISS MILITIA HAS.

With the possible exception of the Militia of the United States, the Swiss Army is the most truly Militia Army in the world; the principles on which it is raised are exactly the same to-day as they were 500 years ago, when the Covenant of Sempach first gave definite form to the League of Cantons. The first organisation dates from 1393, and is, therefore, not as old as our own Militia system; but, unlike that of our own Militia, the organisation of the Swiss Army has been constantly revised and rejuvenated so as to bring it into line both with the exigencies of modern warfare and of the civil conditions of a modern industrial State.

The Articles of 1499, for instance, contain the proviso that the Swiss troops "should make no prisoners, but should kill them all as our pious forefathers did." This proviso is no longer to be found in the Swiss Articles of War; the Swiss are an up-to-date people who keep themselves abreast of the times. Consequently, admiration for their pious forefathers has not prevented them from being the foster parents of the Geneva Convention.

At the close of the 18th century the machinery of the Swiss Militia was hopelessly rusty and antiquated. The Helvetic Confederation was swept into the vortex of the Revolutionary and Napoleonic Wars, the territories were overrun, their cities held to ransom, and their sons compelled to swell the motley horde that served under the eagles of the Corsican. That lesson has never been forgotten. The Federal Council has never ceased during the whole of the past century to perfect and organise and keep bright and burnished the shield and the spear of self-defence, which are of more lasting value than any number of guarantees of neutrality.

The most important revisions of the Swiss Military Laws are those of 1798, 1804 (in which the Swiss had the advantage of the assistance imposed upon them rather than asked of the great Napoleon himself), 1817, 1850, and 1874 (after the lesson of the Franco-Prussian War). Finally, we have the important bill accepted by the Federal Council last month, which still further modifies the organisation of the Swiss Army.

In asking you to see what lessons may not be derived from the Swiss system, let me make it clear at the outset that from Switzerland our Regular Standing Army has little or nothing to learn.

Switzerland has no distant or over-sea possessions requiring for their protection a permanent and highly-trained body of soldiers. Consequently, she has no Standing Army, and no complicated problems of colonial wars and foreign drafts, which can obscure the purely defensive objects for which her citizen force exists.

In the first encounters of a war it has never been questioned that a real Standing Army—by which I mean one which, like our Indian Battalions, is composed of colour-service men—not one which has to be made up to war strength by the infusion of over 50 per cent. of Reservists, will defeat the more numerous forces of an opponent which have been organised on a Militia system. No doubt, if the war continues, the Militia Army tends to level itself up to the Standing Army. But it is not always that the first encounters leave it in a position to do so, especially nowadays, when a few victories at the outset may determine the whole fate of a campaign. In my comparison of the Swiss Army with our own, I have in view only the National and Regular Army of our needs, and to save any misunderstanding on the part of my audience, I desire to make this perfectly plain. Any criticisms which I may make upon our personal system which affects the professional soldier, will be directed towards the relation in which he stands officially to our Second Line Forces, and, of course, not against him personally, or the splendid branch of the Service to which he has the honour to belong.

"The principles for which," writes Sir George Clarke, in the *Times* of October, 1901, "I have long ventured to contend, are that the whole Regular Army should be prepared for employment abroad, and that there should be a distinct Home Army, highly organised on the Swiss model."

II.—ADVANTAGES AND DISADVANTAGES OF A MILITIA ARMY.

But if we exclude altogether our Standing Army from our view, the problem of defence that confronts us, both in the British Islands and our self-governing Colonies abroad, is exactly that with which Switzerland has had to deal. The Swiss system may produce an Army that is far from perfect. The Swiss people themselves would be the first to admit that this was so, and they are doing everything that lies in their power to improve it. In appearance it is certainly very rough; but for all that it is a real Army, which our Auxiliary Forces cannot at present, even by the most imaginative of patriots, be said to be. No doubt, even our Auxiliary Forces would prove far more formidable than by the rules of war we should have any right to expect, and their real value is much under-estimated by the Armies of Europe. Nevertheless, this estimate is a most serious political factor, and if we could make of our existing Auxiliary Forces an Army which was valued abroad as highly as is the Swiss, and duplicate this Army in our self-governing Colonies, there would be less temptation to take advantage of our real or supposed weakness. After all, the prime function of an army is, not to fight but to prevent war. Added to this, if once we could really convince our own people that our passive defence is safe in the hands of our citizen Army, as Switzerland holds herself to be safe in the hands of hers, we should enormously increase the effectiveness of our Standing Army and our Fleet, by leaving them free

to operate in combination as the most powerful offensive weapons in Europe. Not only so, but a population trained to arms and organised for war up to the Swiss standard would give us what we do not now possess, an inexhaustible reservoir to supply waste, and, if necessary, give expansion to our professional expeditionary armies.

DISADVANTAGES.

The advantages and disadvantages of a Militia system have been well set forth by Colonel Ellison in the Gold Medal Essay of this Institution, for the year 1897. The disadvantages are those which, fortunately for ourselves, we are almost completely exempt owing to our insular position. A Militia Army being in its very essence less highly trained at the outbreak of war, and seeking its strength in numbers rather than in professional skill, is less fitted than a professional force to withstand the first onset of an invader. But given time after the crisis has arisen, in which to prepare itself, it becomes rapidly assimilated to a Standing Army, and the material in the ranks being naturally superior, both in physique and in intelligence, it will, if war continues, become in every respect a match for it. The speed with which it will so transform itself depends, of course, on the amount of previous training it has received, and the perfection attained by its cadre organisation. Whatever may be the case in Switzerland, with the British Channel, and the British Fleet, and the Regular Army to act as outposts, there is little fear that our citizen force will not have a reasonable period for enthusiastic preparation.

The other great drawback to a Militia Army is the fact that if it be, as it should be, the whole able-bodied male Nation in Arms, it cannot all of it take the field at the same time, or maintain it as a whole during a protracted struggle. The citizen soldier must perforce earn his livelihood. Consequently, he must be relieved from service at not infrequent intervals, even when a war is actually in progress. This is, however, a drawback which is serious enough in the case of Germany and France, but need not affect us at all. If there were ever an invasion of these islands—and I am far from believing such an invasion impossible—the struggle with the invader would be in England as in Switzerland, fierce and brief, and would be settled one way or another very quickly. In that supreme crisis there would be no single member of the National Army whom interest and honour alike would not place in the fighting line. A war of long duration, on the other hand, would, like our struggle with the great Napoleon, be waged over-seas, and though it would be expensive, and, in certain contingencies difficult, for the large reliefs that would be necessary, to come and go, our Armies in the field would be benefited rather than the reverse, provided always that the reliefs were soundly trained, by this constant infusion of fresh blood.

ADVANTAGES.

The advantages of a pure Militia system are, on the other hand, even from a strictly military point of view, very great.

In the first place a Militia system, of course, implies strict localisation. The student of constitutional history may debate

whether in England the County is older than its Militia, or *vice versâ*. At least, it may be said that representative Government itself traces its descent back to a Militia system, taxation being in its origin the commutation of personal service, and representative Governments the child of taxation. In Switzerland the military aspect of the Canton has never been lost, with us if we desire a true Militia system, that of the County must be revived. The resulting localisation of a Territorial Army is a military asset of the very first importance. Those who are most intimately connected in peace become comrades in war, and an organisation which serves all the complicated machinery of industrial and social life, becomes at once on mobilisation an organisation for war.

From the point of view of the military adventurer, the political conscience and local patriotism of such an organisation is an obstacle to the supremacy of his personal will; but a Nation animated with one spirit against the common foe, and choosing to be led in war by those prominent citizens who are her acknowledged leaders in peace, will find no hindrance in these things, but rather great elements of strength.

That is why in the Swiss Army, the brigade and divisional, and even Army Corps commanders, are, for the most part, not professional men at arms, but the foremost of her citizens, manufacturers, lawyers, engineers, landed proprietors, even the leaders of political parties. These are indeed radical doctrines; taken literally they involve our doing nothing less than marching against the foe under Colonel John Burns, with Colonel Rufus Isaacs as his chief intelligence officer, and the Manager of Harrod's Stores in charge of his transport, with this important preamble, however, that all these gentlemen would, in time of peace, have devoted a good deal of time and more thought—as Militia officers—to the study and practice of war. Meanwhile it cannot be denied that in the simplicity of the machinery required, both for the training and upkeep, and for the rapid mobilisation of the units in their new localities, a Militia Army stands at an immense initial advantage over a purely professional force.

But if the military advantages of a Militia system are great, its political benefits are still greater. By bringing it about that military service is regarded as the natural privilege of every self-respecting citizen, it builds the readiest, and, indeed, the only, royal road towards the attainment of that national spirit, the loss of which no great people have ever survived, and against which, as Napoleon himself found to his cost, the finest Armies in the world cannot contend.

Again, whatever we may say as to the superiority of professional over partly trained Militia Armies, the fact remains, as Colonel Ellison reminds us, that Greece and Rome rapidly declined as soon as circumstances demanded the abandonment of a Militia and the substitution of a Standing Army, and that, if with Talleyrand we regard her ascendancy under Frederick the Great as temporary and accidental, Prussia only became a great nation when in her adversity she stumbled upon a Militia system. I believe that the military authorities at Berlin to-day have no very high opinion of the Swiss Army. If so, they have found it convenient to forget that the Prussian Army of

a hundred years ago, which itself believed, and found others to believe too, that it was still the first Army in Europe, with many generals of greater talent than Napoleon, was obliterated in one single day by what it contemptuously regarded as a mere Militia Army.

DEFINITION OF MILITIA SERVICE.

Before proceeding further it will be as well to have before us a clear definition of what sort of a person the true Militiaman, as seen in his most perfect form in Switzerland, really is. No better definition has ever been given than that propounded by Adam Smith:—"In a Militia the character of the labourer, artificer, or tradesman predominates over that of the soldier; in a Standing Army that of the soldier predominates over every other character." This elemental fact is of the very first importance. Obvious as it seems, it has been too often overlooked by those who have, in this country, been responsible for the regulations governing the enlistment and training of our own Auxiliary Forces. The neglect to realise the practical consequences of this simple fact may be said to lie at the bottom of our failure to produce a satisfactory National Army on a Militia basis.

The crux of the problem with a Militia Army, solved so well by the Swiss, is: How to make a tolerable fighting man out of a citizen with the least possible infringement of his personal liberty or interference with the occupation upon which he and his family depend for their living, and this too at the smallest possible cost to the public exchequer. Civil needs and not military requirements must be the first consideration; the Militia system must be adapted to the people, not the people forced into the grooves of the Militia system. The more that military requirements are allowed to predominate over the necessities or even amenities of civil life, the more does the resulting Army partake of the nature of a professional—the less of a Militia force. The problem is not to produce the absolutely best military force, but the best possible in the circumstances; that is, to find the lowest common denominator between military security and the industrial and economic welfare of the State. From the point of view of the pure economist, every penny and every hour spent upon preparation for war is wasted, while the soldier who places his desires for a fine Army before all other considerations, would on the other hand, demand the whole lives and even the very souls of his men, and could never have too much money to convert into its equivalent in training and in armaments. The two views pushed to their extreme are mutually antagonistic. The Statesman is he who adjusts the balance between them.

But it is evident that the measure of the sacrifice that must be demanded, say, of the employer of labour on the one hand, and of the drill instructor on the other, in order to produce that balance will vary in different countries according to their strategical needs and their world-political aspirations, and not a little also according to the natural military capacity of their people. It takes longer, for instance, to make a soldier out of a Jew than a Jap. In some cases the minimum of security is only attainable at the price of heavy sacrifices on the civil side. In Germany or France, for instance, their geographical situation in the midst of formidable and restless neighbours demands not only the presence at all times of very large numbers with the colours, but also a high standard of training in

each citizen who is passed through the ranks. In order that he may be fit to take his place in the decisive battle between the fourteenth and sixteenth days of mobilisation, the German or the Frenchman is required to sacrifice two years of his personal liberty and of his wage-earning life to military service. In addition, the rapidity of the blow when it comes, and the consequent necessity of instant readiness for war, has brought it about that the permanent or professional cadres maintained bear an ever-increasing proportion to the whole. In Switzerland, on the other hand, aided, as she trusts, by her strong natural frontiers and by her purely defensive policy, it is believed that the sacrifice made may be inconsiderable, and yet the guarantee of security sufficient. The attempt is made to provide for a National Army with a total average training for each man of 164 days (under the proposals of 1906), spread over 8 years of his life, and with a permanent cadre of something less than 218 officers, whose duties are limited to instruction only. In other words, it is a compromise between a People's security and their convenience which decides the amount of training that the military authorities of each country can consider as sufficient in the circumstances.

The common problem in all National Armies is: How to pass as many men as possible through a sufficient course of training, with a due regard to economy, both as regards instructional staff and barrack accommodation. With us, Militia battalions come out for training principally in the summer months, while the instructional staff is idle for a great part of the rest of the year. Even the training of the Militia recruits takes place, to a large extent, concurrently, the consequence being that the amount of barrack accommodation required during one part of the year is very large, while during the remaining months hardly any barracks are needed at all. In Switzerland there are only 13 barracks, with accommodation for 5,950 men, and these have to provide not only for the preliminary training of the annual contingent of some 16,000 accepted recruits, but for the instructional and "refresher" courses of the officers and non-commissioned officers of an *Elite Army* 145,000 strong. The small instructional staff is, accordingly, continually at work. But 145,000 *dépôt* trained men are far from being an Army. It is too often forgotten that the efficiency of an Army depends, not only or principally upon the standard of training attained by the individuals composing it, but also upon the extent to which those individuals have been welded together by the intimate bonds of comradeship, both at home and in the field. There can be no reliable discipline unless the officers and non-commissioned officers know their men and are known by them. In addition, it is necessary to mobilise the Army on a war footing as often and as cheaply as possible in times of peace.

We shall see presently how the Swiss solve the first two of these problems. As regards the cost of their Army, I take it that 4 army corps, plus about 30,000 frontier troops and a reserve 90,000 strong, for a military budget of under one million and a quarter, would hardly be judged as excessive even by our present House of Commons. This sum is inclusive of the expenditure upon the annual mobilisation of 4 divisions upon a war footing, or one-third of the total Army of Switzerland, for *manceuvres* — a

mobilisation which, as I shall hope to show you, is, from one important aspect at any rate, the most complete peace mobilisation attempted in any Army. The total strength of the Swiss Army is as follows:—

Élite ...	...	...	...	...	145,400
Landwehr ...	...	...	...	...	90,000
Total ...					235,400

Or 1 soldier for every 15 of the population, exclusive of the Landsturm, which numbers 297,153, and raises the proportion liable for service in time of war to 1 in every 7 of the population.

It is natural enough that a non-professional Army should be cheap. There are no wages to pay, only out-of-pocket expenses, though to these, under a voluntary system, we are obliged to add some form of compensation for loss of time. Nevertheless, it is startling enough to remember that on the Swiss system we could attain our million men standard for a Militia Army at an annual cost of just over £4,000,000, which is at about the present cost of the 350,000 men in our Auxiliary Army.

It is frequently asserted, and by constant reiteration has become a cardinal doctrine with some of us, that the one incurably weak spot in any Militia system is the utter inefficiency of the officers and non-commissioned officers that it produces. If this were really so, it would go far to render any attempts at a Militia Army a pure waste of time and money, and it would be impossible for Switzerland to afford, or for ourselves to obtain, even if we could afford, the many thousands of additional paid officers and men that would be required. There is, of course, no question as to the superiority of the professional officer over the amateur from the pure point of view of soldiering, nor as to the desirability of a strong infusion of professional men in the staff, the senior grades, and above all in the artillery of a Militia Army. As regards the non-commissioned officers and the company and regimental officers, it is important that they should, as in Switzerland, have the benefit of a thorough grounding as well as of "refresher" courses under professional instructors, more especially in matters of peace drill. But I am heretical enough to believe that if the right material will come forward, a Militiaman, with local connections, who is prepared to be as constantly seen with his men as a curate is in attendance at the afternoon parties of his parishioners (and, as we have said, a true Militia must be strictly localised), should make the best squad, section, company, or battalion commander for Militiamen, just as the Regular officer makes a *sine qua non* of the proper leading of Regular troops. I admit that too often in our Militia and Volunteers the officers and non-commissioned officers are far from up to their work; but it is also sufficiently obvious that the right material has not come forward.

THE GENERAL STAFF.

If I am heretic in this hall, however, I have found myself not only orthodox but somewhat old-fashioned in Switzerland. I owe a great deal too much personally, and so do all my brother officers in the Militia and Volunteers, to the ready and enthusiastic assistance at all times of my friends, instructors, and leaders in the Regular Army,

not to desire to see a strong infusion of the Regular element in the cadres of our Militia Army. But the 218 permanent instructors are the only Regulars in the Swiss Army; they are by law strictly limited to instructional duties at the dépôts; only one-fourth of them are allowed to hold commands in the Field Army at any one time. The remainder, inclusive of a large proportion of the general staff and of the divisional and even army corps commanders, are Militiamen pure and simple. Officers who are selected for staff duties must attend special courses—a course of 70 days as aspirants, of 42 and again of 21 when they attain field rank. The permanent staff of the Stabsbureau consists of a chief and one clerk only. The great mass of the work, including preparation for manœuvres, details of mobilisation, movements and armament, intelligence, even instructional work as adjutants and instructors as supplementary to the instructional staff, is executed by officers temporarily attached for duty. Officers, varying in numbers from 5 or 6 to 30 or 40 at a time, are detailed to perform work in the Military Department at Berne for periods varying from a few days to several months. They receive the pay of their rank while so employed, the budget providing for the pay of 30 officers for 75 days, or an average of 6 all the year round. In this way the general staff gets the advantage of the work of over 100 different officers for the pay of six. Under the same system in England we should have attached Mr. Maxim and Lord Armstrong to the general staff to advise on our late artillery rearmament. Mr. Haldane himself, when in Opposition, would have been attached for explosives, while if remounts were to be bought we should send for a M.F.H. or two of our Militia Army.

A few of the most important of the staff duties are generally filled by (but by no means exclusively reserved for) *Berufsoffizieren*. Of the divisional commanders with whom I came in contact at the last manœuvres, one was the proprietor of a large hotel at Lucerne, another was a lawyer and the leader of an advanced Radical group in the Assembly, a third a watchmaker, and only one a professional soldier. This last officer, however, was by far the most capable man in the field of them all.

REGIMENTAL OFFICERS.

I will now pass to the training of the regimental officer and non-commissioned officer. It is strenuous. We have nothing like it in our Auxiliary Forces, chiefly because of the notion—I believe myself a mistaken one—that if we made the necessary courses too severe we should get no candidates for what is supposed by professional men to be regarded as a thankless job. In Switzerland all who arrive at the military age are obliged to serve as privates, quite irrespective of rank or wealth, and no one can obtain a commission who has not passed through the ranks, nor can he secure promotion to the next grade unless he has passed through a special course.

The exact requirements are as follows:—At the recruits' courses and during the first training the smartest men are selected by the instructors to be non-commissioned officers. No man can refuse promotion to non-commissioned rank—though, of course, this promotion involves longer courses and infinitely more labour than mere service in the ranks. *Il doit payer ses galons*, and those who have this honour

thrust upon them, are put through an additional course for non-commissioned officers, lasting for 28 days for infantry, and 42 for cavalry and engineers, and 35 for artillery; both practical and theoretical instruction are given. The successful candidates are then posted to their battalions, and attend a recruits' course in the following year as instructors, which involves from 53 to 80 days more according to the arm of the service, in addition to the élite or "repetition" course with the battalion. In all the non-commissioned officer does nearly twice as much as the man.

Non-commissioned officers who wish to be officers must possess sufficient educational certificates, and must be nominated by their Cantons. In theory, anyone is eligible to become an officer; in practice, the educational test limits the choice to those who have the money and the leisure to work up for the different examinations. They then, in their third year of service, join a preparatory course of 42 days for the infantry, 60 for the cavalry, 63 for the engineers, and 105 for the artillery, at the end of which they must pass an examination before obtaining their commission. Successful candidates must then attend a further course in a speciality of their arm; in the case of the infantry this consists of a 28 days' course in musketry. The last joined officers have next to attend a recruits' course and an élite training as officers, and a course of 44 days for subalterns of all arms. After this, if they are not anxious for promotion beyond the rank of 2nd lieutenant, they need only attend the annual manœuvre training of their corps. To sum up, a lieutenant passing into the landwehr in his twelfth year of service has received at least 408 days of instruction in courses, or more than three times as much training as the man, inclusive of his annual training with his regiment. If, however, he seeks promotion, then there are further courses as follows:—2nd lieutenant to lieutenant, 6 weeks; lieutenant to captain, 6 weeks; captain to major, 6 weeks; major to lieutenant-colonel, 3 weeks; lieutenant-colonel to colonel, 4 weeks. These courses are confined almost entirely to tactics. In the scientific branches there are, in addition, many technical courses.

The promotion examinations for officers are voluntary, for no one is obliged to seek promotion. But the patriotic emulation in Switzerland is so great that practically every officer does so. These promotion examinations are no farce—there are always more candidates than vacancies, and many are rejected. Only the pick of each rank is promoted, and promotion does not go by seniority—a most important factor in a Militia Army. For all that, so great is the desire to continue in service that promotion is slow, and many of the Swiss regimental officers strike one as suffering from *anno domini*. A captain serves in the Élite up to 38, up to 44 in the Landwehr, in the Landsturm up to 52. But any officer whose efficiency is below par, can be passed at any time into the Landsturm. Direct commissions, after a theoretical course at the Polytechnikum at Zurich, have been abolished. No doubt, Sir Edward Ward's Committee, now sitting to devise a plan of obtaining officers for the Reserve and for the Auxiliary Forces from the Public Schools and Universities, will bear this important fact in mind. Service in the ranks of the Militia Army, followed by the complete practical course, is the only way to a commission in Switzerland.

Table showing service demanded under present system and a New Law of a lieutenant, captain, and major respectively, before he passes into the Landwehr:—

<i>Elite.</i>	Infantry.		Cavalry.		Artillery.		Engi eers.	
	Present date.	Law of 1906.	Present date.	Law of 1906.	Present date.	Law of 1906.	Present date.	Law of 1906.
	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.
1st Recruits' Course ...	45	70	80	90	55	70	50	70
N.C.O.'s Course ...	28	20	42	35	35	35	28	35
Annual Training ...	16	11	10	11	—	11	—	11
2nd Recruits' Course...	53	—	—	—	—	—	58	—
Officers' Course ...	42	80	60	80	105	105	63	105
<i>2nd Lieutenants</i> ...	184	181	192	216	195	221	199	221
3rd Recruits' Course...	53	70	80	90	55	70	58	70
Musketry Course, etc. ..	28	—	11	11	14	14	27	27
Annual Trainings ...	32	55	60	66	54	66	64	66
<i>Lieutenants</i> ...	297	306	343	383	318	371	348	384
Annual Trainings ...	64	66	70	33	54	55	32	55
Musketry ...	—	14	—	—	—	—	—	—
<i>Total on passing into the Landwehr ...</i>	361	386	413	416	372	426	380	439
Landwehr Trainings...	18	22	—	—	16	22	18	22
Captain, on passing into Landwehr ...	492	552	650	692	523	592	568	645
Major, on passing into Landwehr ...	619	701	799	851	691	776	742	846

NON-COMMISSIONED OFFICERS.

While dealing with the officers, I have practically dealt with the non-commissioned officers, for all officers must have passed through the non-commissioned ranks.

We have seen that a corporal does about 103 days more training than the man; a sergeant in the infantry, on completing his twelfth year of service, will have received 240 days of special additional training. The special courses are, however, much longer in the artillery. The non-commissioned officers are all Militia men, there is no permanent staff.

We must not, however, forget two most important facts about the Swiss non-commissioned officer. In the first place, he possesses special intellectual attainments, and has been picked for these and for his powers of command. Most important of all, owing to the strict territorialisation of the Swiss units, he lives in intimate connection with his men all the year round when not on service. In the factory he is the foreman; in the country the farmer employing hands.

As a result, though there is a total absence of class arrogance, the discipline of the Swiss Army is complete.

Nevertheless, one would be disposed to consider that the non-commissioned officers were the weakest feature about the Swiss Militia. On manoeuvres they appeared to lack authority, and the officers seemed disinclined to delegate much responsibility to them. The fact is, that it takes something more than good instruction at a *dépôt* to make a non-commissioned officer. The Swiss non-commissioned officers do not belong to an older military generation than their men, and though their civil connection with their men is intimate enough, they have not, like our Volunteer non-commissioned officers, the advantage of the drill night twice a week. In order to make good non-commissioned officers of Militiamen, an intermittent training, never ceasing the whole year round, according to our Volunteer methods, seems even more valuable than many courses of instruction. The ideal would be a combination of the two systems. General Langlois, who was present at the last manoeuvres, appears to hold the same relatively unfavourable view of the Swiss non-commissioned officer. "Given a good preliminary course of instruction, a relatively independent social position, a carefully thought-out scheme of special instruction, intelligence, and the 'sacred fire,'" he writes, "the Militiaman will make a good officer. But the functions of an officer and those of a non-commissioned officer are essentially different, and demand entirely different qualities. The chief requisite for a good non-commissioned officer is conscientious, painstaking detail, and this can only be acquired by constant and unremitting practices over a long period of time."

RANK AND FILE.

I now pass to the training of the ordinary man in the ranks. First of all it is necessary to realise that on reaching the age of 20, the Swiss recruit has already acquired many of the qualifications which go towards the making of a soldier, and which his defective preliminary education obliges us to spend so much time and money in dinning into ours. He has gone through a course of gymnastics at school, and has, as a member of the local rifle club, generally learnt to shoot. The attitude of the Swiss people to their preparatory training is full of interest to us at the present juncture. The general feeling is opposed to giving it anything of a military character. When the question was brought up by the military department, the Army Corps and divisional commanders were unanimous in desiring that gymnastics should continue to be obligatory in the schools, and that there should be, in addition, voluntary exercises for the physical development of youths between 16 and 20 years of age, who had left school. It was suggested that these physical exercises should take place under an official programme, and that the Federal Government should assist the voluntary societies by making a small capitation grant in respect of each youth of a specified age, who passed a recognised test. But it was unanimously recommended that the special military training should be reserved for grown men, and a clear distinction was thus drawn between physical drill, including the use of a rifle as a part of the general education of youth, and military training as the civic duty of the grown man.

It must be added, however, that voluntary Cadet Corps are encouraged by the State in every possible way, and that rifle clubs

compulsorily established are available not only for the musketry of the Army and the Reserve, but also for voluntary use by such boys as care to avail themselves of them; other voluntary clubs, whose members are chiefly grown men, but open also to boys, are scattered up and down the country—such as tactical clubs, clubs for gun drill, military riding, pontooning, etc. These clubs are subsidised out of Army votes, 1,412,450 francs were paid to them last year, or about one-twentyfifth of the total vote. They take the place of our cricket, football, and golf clubs, and I am afraid we must look the fact in the face that a National Army means the almost entire sacrifice of field sports, especially amongst the upper classes, from which the officers are drawn. They have not the time to serve their country and play cricket too.

As a consequence of this preliminary grounding in manly exercises the actual recruit training can be reduced to a minimum, while the short annual courses that follow are brushing-up courses, not actual trainings. In addition, the men are themselves so interested in making the time spent away from their civil occupation as short as possible, that the system works marvellously well.

Under the law of 1874 recruit service in the first year is as follows:—Infantry 47 days; cavalry 82; artillery 57; engineers 52, counting the days of assembly and dismissal.

Under the Bill which passed the National Council last month, this preliminary training has been increased on the average by 20 days:—Infantry 70 days; cavalry 90; artillery and engineers 70.

While he is at it, the recruit is made to work very hard, on an average 8 hours a day; even on Sundays there are lectures on history, sanitation, and first aid to be attended. Only 1½ days' leave is allowed.

The preliminary training finished, the recruit then joins his regiment. He is a member of this regiment all the year round, as are the majority of his contemporaries in the same locality. Up to the age of 28 he will have to attend a "repetition" course every year, and one inspection of arms and accoutrements every spring. Formerly these "repetition" courses were held every other year up to the age of 32, and lasted for 18 days for infantry, 20 for artillery, 12 for cavalry. They are now to be held annually for seven years, and will last for 11 days only. The musketry course is additional, and is carried out on the local rifle ranges.

The object of the "repetition" course is to prepare the regiment for war. It takes place under the superintendence of the commanding officer of the regiment, and the officers and non-commissioned officers are called out eight days before the men come up for instruction under the permanent instructors. These instructors have, however, nothing to say to the command when the regiment is mobilised. In the infantry the programme is as follows:—

	Days.
Company and Battalion work	8—9
Manœuvres with a force of all arms, Brigade or Division (Army Corps once every 4 years) ...	7
Assembly and Dismissal	3—2
Total	18

The whole of the time is given to tactical work in the field; there is absolutely no barrack square drill. To facilitate this the manual exercises are but two—"sling" on the right shoulder, and Order Arms. There is no formal bayonet exercise.

At the age of 32 the Swiss citizen passes out of the Active Army or *Elite*, into the Landwehr or Reserve, where he remains till he is 45. By the new law this Reserve service is to be reduced by 5 years; a man will, in future, be free of his Landwehr service at 40. During the Landwehr service he has to fire an annual course, attend an annual inspection of arms and accoutrements, and do 10 days' training during the whole period.¹

At the age of 40 he is, under the new Bill, to pass into the Landsturm, where he remains until he is 48. Landsturm service comprises one annual musketry course and one day's inspection of arms and accoutrements yearly—the old Scottish Wapenschaw.

On mobilisation for war the Landwehr must supply drafts for the Active Army, and the Landsturm for the Landwehr. Lines of communication are to be found from the Landwehr, transports, drivers, etc., from the Landsturm.

In theory the Landsturm comprises all citizens between 18 and 48 years of age, in practice it is limited to those who have served in the *Elite* and Volunteers who can shoot.

Men and officers, who prove "duffers" in the *Elite* can be passed straight into the Landsturm.

To sum up, the Swiss system of training is a short period of preliminary instruction longer than that which generally obtains in the case of our Militia, but far shorter than that considered necessary in the great Armies of Europe, followed by a yearly manœuvre training

¹The following table shows the obligations of service under the old and the new systems at a glance:—

CONDITIONS OF SERVICE UNDER THE PRESENT SCHEME AND UNDER THE NEW LAW CONTRASTED.

<i>Elite.</i>	Infantry.		Cavalry.		Artillery.		Engineers.	
	1874.	1906.	1874.	1906.	1874.	1906.	1874.	1906.
	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.
1. Recruits' Course ...	45	70	80	90	55	70	50	70
2. Repetition Courses ...	80	77	100	80	90	77	80	77
3. Inspection of Arms, etc.	12	5	10	2	12	5	12	5
Additional under Law of 1874 ...	16	—	—	—	18	—	16	—
Total ...	153	152	190	172	175	152	158	152
<i>Landwehr.</i>								
1. Repetition Courses ...	10	11	—	—	12	11	10	11
2. Inspection of Arms, etc.	10	7	14	10	—	—	—	—
<i>Landsturm.</i>								
Inspection of Arms ...	6	8	6	8	6	8	6	8

N.B.—Not including days of Assembly or Dismissal, or of Annual Musketry Courses on the Local Rifle Ranges.

with the *Élite* up to 28 years of age, and a further service of 12 years in the *Landwehr*, and 8 in the *Landsturm*. The changes effected by the new Bill are in the direction of slightly prolonging the preliminary drill, and generally lightening the burden of further service by discharging the elder men five years earlier, and concentrating the training of the younger ones into a shorter term of years. Instead, however, of compressing this all into one or two years of continuous service and then passing the man into the Reserve, as is the rule elsewhere in Europe, the Swiss have clung to the valuable principle, so clearly recognised in our own Auxiliary Forces, of retention with the colours with an intermittent training spread over a long period of years. The value of the compulsory part of the intermittent training is greatly enhanced by the voluntary work put in during the year by a large proportion of the officers and non-commissioned officers, and by the strict localisation of the Militia force, which enables the members of a given regiment to meet each other daily, and thus, while pursuing their ordinary avocations, learn to cultivate that *esprit de corps* which is the most valuable of all military assets.

The rifle clubs form the weekly recreation of the men, the tactical societies provide a capital holiday outing for the officers and non-commissioned officers. These military societies are granted special terms by the hotel proprietors—*o si sicut omnes!*

PAY.

The pay of the Swiss Army is fixed on a modest scale, but then the President of the Republic only receives £540 a year. The men get their rations free and about 70 centimes a day clear for pocket money. They are insured by the State against accident while on duty.

The pay of the officers ranges from 7 francs a day for second-lieutenants, to 10 francs a day for captains, 15 francs for lieutenant-colonels, and 20 francs for colonels.

A complete uniform may be bought for £10, and towards this the State gives an outfit allowance of £8.

Messing in barracks is exceedingly cheap, the rate is from 2s. to 2s. 6d. a day. On manœuvres the messing allowance for officers is 1 franc daily. There are no messes on manœuvres, and there is no regimental plate.

PHYSICAL STANDARD.

The physical standard required of the recruit is very high. Of the 26,000 young men who become available every year, only 16,000 are incorporated in the Army, though all able-bodied males between 18 and 48 are, in theory, liable for service in the *Landsturm*. That this physical standard is no pretence will be evident enough when I tell you those of us who were present at the last manœuvres saw divisions—the day's operations being over—starting, as fresh as paint, for their bivouacs 20 miles off. Those operations, however, had involved a march, including fighting, of 32 kilometres over a rolling country, with hills 3,000 feet high, while the pack carried on each man's back weighed 60 lbs. when dry. The St. Gothardt detachment climbed 7,000 feet one evening, had a fight at the top, and rejoined for the day's fight in the morning.

Citizens who are not selected for service in the Active Army have to pay an annual and not an inconsiderable tax. This tax goes half to the Military Department, and half to the Cantons; last year the share of the Military Department amounted to 2,150,000 francs. Passive resisters, who either cannot or will not pay the Military Tax, which is graduated according to wealth, are deprived of the franchise, and may not enter a public house. Men are allotted to the various arms according to their profession, education, physique, and position. For the cavalry, only those are selected who are in a position to maintain a horse. Volunteering for the different arms is allowed as far as possible; but there is no possibility of a man, who is posted, say to the artillery, which demands the longest courses, crying off. The cost of the Army thus obtained is about £1,250,000 a year, the total budget of the Swiss nation being £4,000,000.

The most interesting items in the budget are:—

	francs.
<i>Personnel</i> { Administration	1,287,080
{ Instruction	1,439,046
Voluntary Societies	1,412,450
War Material	8,096,538
Insurance of Men Serving Against Accident	781,000
Landsturm	32,000

ORGANISATION.

It is, perhaps, from the organisation of the Swiss Army that we have most to learn at the present juncture. Like the system of training and of service, the organisation follows true Militia principles.

For purposes of command, training, manœuvres, and war, Switzerland is divided into 8 practically equal districts, each district comprising two or more Cantons, and corresponding to the 8 divisions of which the Field Army is made up. There is an infantry training school or dépôt, under permanent instructors, for each divisional district, the training of the other arms being carried out at extra-Territorial Schools.

The following are the articles of the new Law, which show exactly the Scheme of Territorialisation. It must be added that under the old Scheme the Artillery were raised and trained in Cantonal units. Under the new Bill, the field batteries and companies of position become federal units, and are to be trained at central federal dépôts:—

ART. 138.

Le Conseil fédéral divise le territoire de la Confédération en arrondissements de division, délimités, si possible, de manière à composer les unités de troupes d'une division des hommes d'un même arrondissement. Les limites des arrondissements doivent coïncider, autant que possible, avec les frontières cantonales.

Des arrondissements spéciaux peuvent être créés pour les troupes de montagne.

ART. 139.

Les cantons sont divisés en arrondissements correspondant, dans la règle, au rayon de recrutement d'un régiment d'infanterie d'élite.

Lorsque cette division ne sera pas possible, on créera des arrondissements d'un ou de deux bataillons et même des arrondissements de compagnies.

Le Conseil fédéral délimite ces arrondissements sur préavis des cantons.

ART. 143.

Les cantons forment les compagnies et les bataillons d'infanterie (fusiliers), ainsi que les escadrons de dragons.

Lorsque les effectifs d'un canton ne suffisent pas pour la formation de bataillons ou de compagnies, l'Assemblée fédérale décide de leur groupement.

La Confédération forme toutes les unités, tous les corps de troupes et tous les états-majors qui ne sont pas formés par les cantons; elle organise les services auxiliaires.

ART. 144.

La Confédération assigne aux unités cantonales les soldats et les cadres d'autres armes qui leur sont nécessaires.

The command of the Swiss Army is vested in the Central Federal Council, which delegates all matters concerning intelligence, training, inspection, ordnance, and promotion to one of its own members, who himself a Militiaman, practically acts as War Minister, and controls the permanent heads of departments at Berne, and the permanent instructional staff at the dépôts. The Central Department at Berne is divided into 12 sections as follows:—Infantry, cavalry, artillery, engineers, general staff, survey, ordnance, medical services, veterinary services, remounts, supply services, military law, and the senior officer in charge is a *Berufs offizier*. The eight divisional commanders take their orders from the four army corps commanders, and they in their turn from the chief of the Military Department at Berne. There is no Commander-in-Chief except on mobilisation for war, and no rank above that of full colonel. In addition there are certain fortress and technical troops which stand outside the divisional system. The organisation for command training and war is thus in the hands of the Central Military Department controlling the army corps and divisional machine.

But for purposes of peace administration there is a noteworthy incursion of the territorial or civilian element. The Federal Council is in military matters supreme, but for purposes of administration it contents itself with laying down the liabilities of the various Cantons, and leaves all executive action to the civil cantonal authorities. The cantonal troops, being assigned to definite divisions of the Army, each canton is responsible for finding and maintaining its own contingent. Zurich, for instance, is responsible for 10 battalions of infantry, 4 companies of rifles, 3 squadrons of dragoons, 6 field batteries—all of the 8th Division—with their proportion of Landwehr troops, and in addition has 1 company of garrison artillery unallotted to the Field Army. Certain technical arms, like the engineers, stand outside the cantonal organisation. The Military Department of each Canton stands in the same relation to the Cantonal Council as that of Berne to the Federal Council. Its chief, a Militiaman, is a member of the Council, and is assisted by a commissary, an arsenal superintendent, and 1 com-

mandant for each recruiting district. The duties of the Cantonal Military Department are as follows:—Recruiting, roster of citizens liable for service, whether in *Élite* or *Landsturm*; nomination of candidates for commissions; reserve; clothing and equipment for the contingent (each man having his first supply of clothing and his arms with him in his own home); calling up of troops for training or war; keeping the register of all horses in the Canton and provision of horses for all units except cavalry; care of the mobilisation stores; collection of military tax. In all these matters the Cantonal authorities deal direct with the military authorities at Berne, without the intermediate link of the divisions and army corps, which are purely military formations. The money is found, in the first place, out of the Military Tax; if this proves insufficient, it is augmented out of the Central Funds. To sum up, the territorial and army corps or divisional systems are combined in such a way that in time of peace the civil organisations of the 25 Cantons are made to serve all the business of a military population, while in time of war they furnish men, clothing, equipment, stores and remounts to the 8 divisional headquarters where they are welded into an Army.

It is noticeable, and very much to the point, for our own strivings after a Territorial Army that the very real danger of friction between the military authorities of the Army and the civil authorities of the Cantons is foreseen and discounted by the express elimination of the army corps and divisional commanders from matters of administration, as also by the important fact that the main bulk of the officers comprising the Central Department at Berne are not professional military men but *Militiamen*. It would, I think, be inconceivable to the Swiss people that our proposed County Associations, which, as we understand, are to perform almost exactly the same duties as do the Swiss Cantonal councils in connection with the Territorial Army, could act smoothly under the orders of a central War Office composed entirely of professional soldiers, or that of all the innumerable rooms in our new War Office only six should be allotted to the representation of the Territorial Army. They would probably consider the creation of a special civil or Militia department in the War Office essential, as an intermediary between the military chiefs on the one hand, and the civilian county authorities on the other. Above all, it would puzzle them sorely to find a place in their system of a Territorial Army for our administrative generals of the Esher scheme, suitable enough though these clearly are for the administration of a Regular Army, which is essentially extra-territorial. Fortunately for the Swiss people, their Army problem is not complicated by the need for a Standing Army. If it were, they would probably regard it as much as an organisation apart from the Territorial Militia, as we regard the Navy as distinct from the Army. At the same time, they would recognise how enormously such a professional Army would increase the value of an instructional staff, which could in such circumstances be drawn exclusively from Regular officers, who had had experience of war. But even so, they would probably stand firm, by what is, at present, a cardinal principle of their Militia system; the instructors would not be regarded in any sense as forming part of the Militia Army, and on mobilisation would not, except in exceptional cases, take the field. They would remain behind continuing their instructional duties, while the Militia ideal would be upheld in its entirety, so far as leadership in war was concerned.

If they had a Standing Army, however, they would probably do well, as should we, to appoint a few generals to the chief commands on the outbreak of war. In Switzerland the enemy would be that country which infringed her neutrality in a European war. Consequently, if the Germans did so, the ally of Switzerland would be France, and *vice versâ*. Probably the commander-in-chief would, in these circumstances, be a general officer supplied by Germany or France, as the case might be; that is to say, a tried professional soldier. That is why there is no rank in the Swiss Army above that of colonel. In other words, the Swiss would say that our failure to create a real Militia Force is almost entirely due to the confusion of thought, which has inextricably muddled it up with a Standing Army.

In Switzerland there is, practically speaking, no professional staff corps, and no permanent regimental cadres to fill, as in Germany, the brain and nerves of the whole military body. Consequently, it is demanded of that body to supply brain and nerves of its own. The result, in obedience to the law of self-help, is a thoroughly healthy physiological product.

How far the system thus devised by the Swiss nation will actually stand the test of war, it is, of course, impossible for anyone to prophesy. When organisation and training have been provided for, the deciding factors in failure or success are the personal qualities of courage and endurance, national enthusiasm, and natural genius for war, of which nothing certain can be predicted until they are actually put to the test. At least, the Swiss have military traditions which are second to none of those of the martial peoples of the world. The Swiss pikeman shared with the English archer the honour of being the terror of mediæval Europe. He broke the power of Leopold of Austria, and humbled Charles the Bold of Burgundy. Up to the middle of the 16th century the Swiss infantry were the backbone of the necessary armies of the continent. War was, in fact, the main industry of the Swiss people. So much for past history. As for the modern Swiss Army, at least it can be said of it that it is based on a logical and consistent scheme; that the scheme is thoroughly carried out; and that machinery of its organisation may court comparison with the most scientifically organised Armies of the continent.

MOBILISATION.

In one respect the organisation is even superior to that of all the Armies of the world. Once every four years each army corps is mobilised for manœuvres. When so mobilised it takes the field for manœuvres exactly as it would for war—its cadres at full war strength, its scale of transport and equipment complete. Thus last year the IVth Army Corps was mobilised. Next year it is the turn of the Ist, and so on. The commander of the Army Corps next for mobilisation is the director of operations for the manœuvres of the year before. The officers of his Army Corps act as his assistant directors and umpires, and these hold a staff ride over the manœvre area the week before they take place. All other officers may attend in plain clothes. There is no other military force in Europe, with the possible exception of our own Militia and Volunteers, whose strength is at all times miserably below establishment, and who possess no reserves whatever, where a single brigade, let alone an army corps,

habitually takes the field for manœuvres with every man and officer in the ranks who would be called out for war, and this without in any way infringing upon the reserve. The advantages to all concerned of manœuvring with units at war strength are so apparent, and must so make our mouths water, that I need say no more of this inestimable advantage conferred upon Switzerland by her firm adherence to the ideal of intermittent training for short periods at a time, which is of the essence of true Militia service. The strength of the Swiss Militia lies in its immediately available strength of serving soldiers; this, too, is the strength of a strong battalion of our own Volunteers. That is why 1,000 Swiss Militia might certainly be regarded as the equals of 1,000 of our own Regular troops, who had been made up to war strength by the infusion at the very last moment of 700 reservists.

Moreover, this mobilisation, thanks to its strictly territorial organisation, can be carried out with great rapidity. About a month before the last manœuvres there was rioting in Zurich, and the local troops were called out to keep order. They were all in readiness within eight hours of the receipt of the order.

On manœuvres the troops may go anywhere; there are no pheasants in Switzerland. A few standing crops are marked, which should not be entered unless the tactical situation imperatively demands it. Liberal compensation is paid for damage done.

TRANSPORT.

The transport arrangements are good and workmanlike. Those used for the 40,000 men engaged at the last manœuvres worked without a hitch. Only a portion of the wagons belonged to the Military Department, the rest being civilian transport requisitioned. All of it, however, was of a similar pattern, and there was a complete absence of disorder upon the line of march, such as has been observed when civilian transport has been employed in other countries. The horses were strong and well fed, the harness was in good order, and in spite of the hilly nature of the country, there were no breakdowns. The amount of transport was naturally small, owing to the heavy pack carried by the soldiers, and to the absence of tents. It is quite incredible that our Home Army, intended primarily for warfare in European countries, should still carry tents instead of billeting or bivouacking, as the case may be.

REMOUNTS.

If there is a burning question to-day it is that of remounts. As I have already stated, horses for all branches of the Service except the cavalry are found by the Cantons, the larger proportion of them being, of course, hired only for the manœuvre period, but retained on the register and liable to be called up for war. For the cavalry horses the same system is followed as that proposed experimentally with certain of our own Yeomanry corps, the Swiss cavalry being, in fact, exactly what our Yeomen are—at least, in theory. The horses, which are of a very good stamp, are purchased mostly in Ireland and Austria at prices ranging from £40 to £60. They are turned out and acclimatised for six months, and are then trained in the remount dépôts, both as chargers and to go in harness. The cavalry recruit at the end of his training, buys his horse by auction, the upward

price being limited. He pays as deposit and as security, for proper care and treatment, half the value of the horse, and takes it home with him where he can use it for any purpose but drawing a fire-engine. This sum is refunded to him in 10 annual instalments, so that at the end of his service the horse becomes his own property. If the horse dies under circumstances for which he is not to blame, it is replaced by another at half cost price, less the amount of the instalments in the first horse not already repaid. If the new horse outlasts his master's period of service, it has to be sent up for the annual training. It is then called a "*cheval de tiers*," and is used for mounting buglers and foreign officers. Military cyclists similarly buy their bicycles from the State at half-price.

The horses are excellently well trained; at the March-Past last September, not one broke into a canter. The remount depôts are in the charge of two or three permanent *Berufsoffizieren*, assisted by a succession of cavalry officers who are attached for the time. The rough-riders, grooms, etc., though probably serving in the cavalry at the time, are engaged purely as civilians at civilian rates of pay.

ARTILLERY.

I am not an artillery expert, and I cannot pretend, therefore, to an opinion as to whether the Swiss have succeeded in creating an efficient Militia Field Artillery. Moreover, at the last manœuvres they were not armed with their new field gun, and the men of the latest classes of the Elite who are to serve these guns were not present at manœuvres. The Swiss themselves seem to have very little doubt on the matter. The new Q.F. gun is reported to be an excellent weapon, and at the same time not too complicated, as might be supposed to be the case, for their Militia gunners. They are certainly adepts at moving both heavy and field artillery in a most mountainous country, with a swiftness very reminiscent of the Boers. This suggests that they may be quite as good as the Boers also at shooting straight. Their artillery tactics are not those that are fashionable just now in England. But, doubtless, we shall one day come back to them as the wheel goes round.

In consequence of the introduction of the Q.F. gun, their field batteries have been converted from 6 gun to 4 gun batteries. Nevertheless, the total number of field guns in the Swiss Army remains undiminished; the number of batteries having been proportionally increased. The ammunition columns are manned by the *Landwehr*.

MUSKETRY.

The musketry system of the Swiss Army is a subject demanding a lecture to itself. I can here only call your attention to the salient points. The provision of ranges, now a matter of extreme difficulty and expense in England, and so gravely affecting the efficiency of our Auxiliary Forces, is obligatory upon the Cantonal authorities, with the result that there is now a rifle range absolutely at every citizen's back door. Until this obligatory duty was imposed upon the Cantons, however, primarily in order to enable the Militiaman to shoot his annual course, rifle clubs were quite sporadic in Switzerland. Then only did they become universal, and, in fact, the principal manly recreation of all classes, whether in the Army or no.

Secondly, the whole of the individual practices are carried out on short ranges, under 500 metres, the majority at 200 and 300 metres. Even the collective practices are at ranges not exceeding 600 metres. The theory is that the short ranges are still the decisive ones for infantry fire, a theory certainly supported by the Manchurian and South African campaigns; while at long distances, firing at unknown ranges without a marker, and a flag, it is thought that a man who can hit a button at 100 yards, is quite as good as another who can score a bull's-eye at 1,200. The supply of ammunition is more liberal than with our Regular Army, and vastly more so than with our Volunteers.

COMPULSORY SERVICE.

I have left to the last the thorny question of compulsory service. Since the whole object of what I have said has been to discuss what practical hints we can find in the Swiss system which are immediately applicable to our own, I need not detain you very long, since compulsory service in England, in however mild a form, is at present beyond the range of practical politics. Nevertheless, it must be honestly admitted that the Swiss regard the compulsory principle as the bed rock of their own, as it is, indeed, of all real Militia systems. It is compulsory service, too, which solves the riddle of the marvellous cheapness of the Swiss Army. A voluntary system must always render financial compensation necessary—to the man for his loss of time, to the employer for the loss of his man.

But surely the whole question of compulsory service resolves itself into this. An Army on the Swiss model is only possible when the national spirit is strong and healthy, and the willingness to sacrifice personal ease and personal business to the national security permeates all classes of society. Is it, then, compulsory service which creates the national spirit, or the national spirit which renders compulsory service possible? It is clear, at any rate, to the impartial observer that while the Swiss Army derives many advantages from being based upon universal service, the reasons why it is as formidable a machine for war as it is universally admitted to be are not solely or chiefly due to compulsion.

The pride and joy with which the average Swiss citizen finds himself passed for service in the Army; the emulation with which the middle and upper classes vie amongst themselves for commissions and promotion; the public opinion which would boycott any owner of landed property who refused to place his ground at all times at disposal for manœuvre purposes, and forces even the tailor to provide uniforms at little more than cost price, and hotel proprietors to accept the most modest of profits upon provisions or accommodation for officers and men of the Army, are not certainly the result of compulsory service. Nor surely is the keenness exhibited by all ranks, whether under instruction or at manœuvres, or in the voluntary military clubs, to the supplementary work done by which the efficiency of the Swiss Army is so largely due. The spirit which makes employers of labour proud of the proportion of Militiamen in their employ, which causes the billeting of a detachment on manœuvres to be the signal of rejoicing in the fortunate village which the chances of war have selected, and induces even the extreme political Socialist to support the military budget, are the result of public opinion and

not of a law which is the expression on parchment of the universality of that opinion. The Switzer serves because he is made to; true, but he serves with enthusiasm and zeal because he knows the thing is worth doing. In our own Militia and Volunteers we have not all, at all times, this inspiring conviction. In fact, we are frequently told by those who ought to know that it is a pure waste of time. To every proposal we make, which would enhance the efficiency of our corps, we get the same answer, "cannot be entertained." Of positive constructive reforms, emanating from above, there have hitherto been none whatever. So we go away and play golf, or do not join at all. No one in his senses would, of course, object to so mild a measure of universal service as obtains in Switzerland, more particularly when safe-guarded, as it is in that country by the almost entire elimination of the purely military man. Universal service would, of course, enormously simplify our Home Army problem. It would sweep away the absurd inequalities in the strength and distribution of our units. It would confer upon us the immense advantage of being able to take our recruits at the age when we want them, and so seeing our battalions composed of compact and level bodies of vigorous manhood. It would secure for military service the best muscles and the best brains in the State, but if we followed the sound Swiss model of strict selection, it would not provide, as is so often claimed on behalf of compulsory service, a semi-humanitarian remedy for physical or intellectual degeneration.

It is true that Switzerland has no sea coast, and is, therefore, not cursed with the "Blue Water School."

But more detrimental to the prospects of compulsory service in England, than all the fables about the inviolability of this island, is the existence of our absolutely indispensable Standing Army. On the one hand, it is the paramount necessity of maintaining this at huge cost, which renders us liable to forget that to place a Militia Army side by side with it, is not to increase, but actually to counteract the dangers of militarism or of an over-powerful executive. On the other hand, it is the far more questionable necessity of keeping a varying but still considerable proportion of this Standing Army at home, even more than Blue-Water theories, which tempts us to forget that for a national emergency only the Nation in Arms will be sufficient.

In any case, the encouragement of the voluntary system is in itself no hindrance to universality in the future, and our business to-day, as practical men, is to make the best of the voluntary system. Fortunately, while our people show an almost insurmountable objection to being dragooned even into the paths of virtue, they do also exhibit signs of surprising military enthusiasm, more particularly when the forces of Government are directed towards snubbing and starving their irregular military proclivities. I am not suggesting, Mr. Chairman, that you should continue that *régime* of neglect. In the past it has served a useful purpose in providing that measure of adversity which has been necessary in order to temper the military enthusiasms of unauthorised persons into a capacity for warlike endeavour—a valuable result which might never have been attained under a more paternal War Office. During the long winter of our discontent, the Militia and Volunteer plant has struck its roots deep down into the soil of this England that we love. It remains for you to provide

the genial sunshine which will so transform it that its branches cover the land. In the organisation which you now have in view for your National Army, distinct from, but in no way antagonistic to, our Regular Expeditionary Force, I am sure that you fully realise the great significance of the shining example set by democratic Switzerland.

The CHAIRMAN (The Right Hon. R. B. Haldane, K.C., LL.D., M.P., Secretary of State for War) :—Pending the interesting production of the slides upon the screen, a process which takes a few moments in preparation, I will venture to make a very few observations, and I do so now the more willingly because other duties will presently call me away, duties which, however, will not interfere with your discussion. One thing there is which I think we must all be agreed upon, namely, that the records of the JOURNAL of the Institution will have a most valuable addition in this address. With regard to the nature of the Swiss Army as it is to-day, the advantage of Major Johnson's lecture is that it is based upon recent investigations of that Army, in the midst of its changes, and I doubt whether we have ever had a clearer or more distinct picture of the organisation than the lecturer has set before us. Moreover, he is at a great advantage, inasmuch as he is an intense student—I can use no less an adjective—of the organisation of our Auxiliary forces in this country. No man has put more energy into pondering upon the deficiencies of our system, and, therefore, we have had the advantage of a background in his mind right through all—a contrast between our own system and the Swiss system, which has brought out with greater distinctness than could otherwise have been the case the contrast between the two. There were several points which struck me as he went along. One is the demonstration which the Swiss Militia affords, and which he brought out with great lucidity—that you can have an army of this kind, what many people would call an irregular army, on the basis of being a force of all arms. There is an old superstition that you cannot have artillery except upon an expert basis so high that it is unattainable by civilian trained persons. No doubt the training for the artillery must be of the very highest, but then in a civilian population there are people of very high expert capacity. The Swiss use those, and they use them in a fashion in which you could not use anybody who is not of that very high civilian-trained expert capacity, which makes up for a good deal which it is necessary to supply to the average professional artillery. That is how they get that artillery system. Whether it is good or whether it is bad we have no materials on which to judge; and Major Johnson very wisely refrained from committing himself upon that point. But the fact remains that they have organised a force of all arms containing artillery just as much as anything else, and artillery of which they are not ashamed. I observe that the Landwehr supplies the ammunition columns of the Swiss artillery. That is an illustration of how a man can do with a short training in his early days, at the proper military age, and still render excellent military service. All these and other points have been raised in this very interesting lecture, and we are much indebted to Major Johnson, and a much wider circle than this audience will be indebted to Major Johnson when the lecture is published in the JOURNAL of the Institution. It is really by taking thought of what other people are doing, by studying their systems, by looking to the points which experience has borne in upon them, that we get conscious in a clear fashion of the deficiencies of our own system, and I do not think that anybody can have listened to Major Johnson's discourse without feeling that our

own system is very full of deficiencies. It has been a great pleasure for me to be here, and, what is not always true, great profit for me to have heard this lecture; and I thank you for the opportunity you have been kind enough to afford me of listening to the lecture and asking me to take the Chair on this occasion. I now ask Sir George Marshall to be kind enough to take my place in the Chair during the discussion which is to follow.

Colonel W. C. E. SERJEANT, C.B., 5th Battalion Rifle Brigade:—It is rather embarrassing to be called upon to follow a lecturer who has given us such an admirable paper; but if I may be allowed I will venture to make a suggestion with reference to one point, at all events which I think will not be uninteresting to those present. The lecturer referred to 1393 as the year during which, or about which period, the Swiss Militia originated, and I think, unless I am mistaken, he stated it was very much earlier than the period at which the English Militia was originated.

Major JOHNSON:—No, I did not say that; I said almost as old.

Colonel SERJEANT:—I beg Major Johnson's pardon for having misunderstood him. The English Militia originated in the year 872, under Alfred the Great. The analogy is curious. And here I would point out the desirability of all professional and irregular soldiers being thoroughly conversant with military history and with the constitutional history of their country. The analogy, I say, is curious, because we find that, when the feudal system ceased to exercise those attractions and advantages which, during the Norman and Plantagenet eras, it did exercise, especially in connection with aggressive military operations, the value of the English Militia system gradually asserted itself. In the 13th century the Militia of England flourished, and reached its zenith in the 14th century, and at this period continental nations regarded it with envy. But whence comes this excellent system of Switzerland? Why, it was adapted from our own ancient and efficient organisation, absolutely; and in the 17th century it was remodelled on the Cromwellian system. Then the question arises as to why we have failed in our Militia system, while in Switzerland they have been steadily progressing, until now they have arrived at, at all events, a satisfactory condition of things, without the expenditure of a prohibitive sum. The reason is plain. We have never regarded, since the inception of a Regular Army in 1666, our great national problem of defence, as what it is in reality, a purely social and civil problem, and not a military problem. That is the whole solution of the defence question. We do not recruit in our Militia the class which we once did under compulsory conditions and under voluntary conditions, namely, the artisan and the operative—the very class they have in the Swiss Militia, composed of experts who require comparatively little training in order to make them into good soldiers. Instead of that we take the ungrown, raw, and ignorant boy of fifteen, sixteen, or seventeen years of age. Why? Because we do not regard this question as a social and civil problem, but merely as one of recruiting for the Regular Army. We take the boy and fill him out with good food, and in a month or two he goes into the Regular Army as a soldier. Is that what you can call a Militiaman of the ancient and valuable type? No, certainly not. It never was the type of former Militiaman—of soldier—which made old England's name, and it is not the Militiaman which we can designate and honour by the name of Militiaman as he is known in Switzerland at the

present time. The condition of our ancient Militia is the condition we should return to, and it is this condition which we hope will be introduced by Mr. Haldane in connection with his Territorial Army. The old Militia conditions would not clash with Army conditions in any way, but would assist the Army in every way. Why? Because by popularising military service throughout the country—by inducing grown men to bear arms, instead of employing children in arms—we shall promote those conditions under which His Majesty's Service will be as highly thought of and as universally supported by both classes and masses as it was in the olden times. We want soldiers; whether we label them as professional or as Militia it matters not. The function of the soldier is to kill. Now, I have had a little experience on active service, and I can assure you that I have known a good many soldiers—both Regulars and Irregulars—who were trained rather to be killed than to kill. Something has been said about the value of sport, and that sport has made old England. But I would suggest that this applies to field sports and not to games. Fishing, shooting, and hunting in the olden times made soldiers, made officers whom the men respected and followed. Why? They were artists at their work; they knew how to kill their man as well as to kill their game. The object of the soldier is to kill; but golf, football, and cricket are the games of boys, and should be regarded as such. It is true we cannot all indulge in hunting, we have not the means, and we cannot all engage in game shooting, because we have not the ground; but we can all indulge in rifle shooting, and if we could only popularise the Service, and bring back into it the class we once had, which now composes the Militia forces of Switzerland—based on our old model—if we could only induce the authorities to permit us to have the honour of serving under the conditions that we once served under, the Military and Militia Forces of the Crown would again be immensely popular. One word and I have done. It is impossible to dragoon this nation into compulsory service. The lecturer hit the nail on the head when he said that it was the spirit of a nation which brings about compulsory service. I hear gentlemen proclaim the necessity for forcing "compulsory service" on the country. Who are the gentlemen who do it? In many cases those who have been instrumental in evolving the conditions under which the unpopularity of the service is manifest to-day. What we want, Sir, is proper consideration and proper treatment for every class serving His Majesty in each branch of the public service. We want officials who shall be compelled by the public voice to consider and encourage all ranks of His Majesty's service, to perform the duties they undertake to perform, and for which they are paid—conscientious men who will insist on selecting officers for responsible positions, irrespective of social status, irrespective of all considerations; but those which tend to efficiency. We want men who can command, if necessary, without flashing their commissions over their subordinates; we want officers who know their job and whom the men instinctively recognise as knowing their job, who will appeal strongly to their subordinates on the ground of individual capacity, of comradeship, and of sound consideration. Those are the men who will recreate the forces which are now needed by old England to maintain the spirit of British patriotism and the prestige and integrity of the Empire.

Lieut.-Colonel W. H. JAMES, R.E. (Retired):—I am sure that our Chairman voiced the feelings of the assembly when he congratulated the lecturer on the very valuable paper he has given us. I think we are also much indebted to Mr. Haldane for being present here to-day. It

shows that he is willing to listen to "the man in the street" as well as to his own official advisers; and I can only regret that his official duties have prevented him from stopping here longer and listening to the discussion. I am quite aware, as you are all aware, that the path which Mr. Haldane has to tread is by no means spread with roses. Criticism comes to him from all sides, even from his own supporters. The *Daily News* has its eye on him, and in an article which appeared in to-day's paper, various threats are used against our latest example of military reform. Whether Mr. Haldane will be of sufficient power to overcome them, or whether the *Daily News* will win the day, lies in the future. I think the lecturer has brought up many points which are of very great interest to those who take an interest in the military organisation of this country. He points out the absurd and wayward growth of the various branches of the Volunteer service. Everybody knows that the Volunteer Artillery extends in a band across England where they are not wanted; and on the coast, where they are wanted, they are not existent in the numbers they should be. I venture to think (and I allude to this point especially because the lecturer has suggested that perhaps it would be a desirable thing to allow the Auxiliary Forces to manage their own business very much more than they have hitherto done)—I allude to this because I venture to say that this is a patent example of the non-direction of the energies of the Auxiliary Forces, which ought to have been given from the central authority. Had the War Office of those days properly regarded the conditions of the forces, they would have said: "Do not make a rifle corps; have an Artillery Volunteer Corps here," or *vice-versâ*. Nothing of the sort was done, and the consequence is this very anomalous distribution of forces at the present moment. I would observe that there is no analogy between putting the Auxiliary Forces, so to speak, on their own, and the Swiss military organisation, because in Switzerland, and in every country in which compulsory military service exists, the men who administer the Army have necessarily gone through the mill themselves, and are therefore in a better position to deal with it than those who are mere amateurs, and sometimes have had no experience whatever at all. Supposing my friend, the Right Hon. John Burns, were to be made a field-marshal tomorrow, although the author only gave him the rank of general, even if he only had that poor rank he would have had no experience whatever. Whereas, if he lived in France—had he been a Frenchman or a German, or even a Swiss—he would have had a certain amount of military training. So that it is not an analogous position. The lecturer more than once used the expression "Standing Army." I believe there is hardly anybody in this room who does not know that a standing Army in the sense in which the lecturer used the term has been non-existent for years. A standing Army is necessarily an Army which serves practically for life, and which has no reserves of any kind behind it. Such an Army was that with which Frederick the Great fought against the Powers of his time, and which we employed in England at that time. But certainly since the introduction of general service in France a hundred years ago, there has never existed anywhere in Europe any system but that which beat Napoleon in 1813. Why was that system a good one? Because the whole manhood of the nation was forced into the Army, and it obtained from the débris of the old Army, cadres of trained soldiers able to administer it in the field. A similar fact is the case with regard to the French Army of 1813. The French Army of 1813 was able to do what it did, although it consisted almost entirely of conscripts, because it found cadres ready to take up the administration and command the men in the field. Hence they were led

to victory by Napoleon. But an Army of a purely amateur kind, which has no properly trained cadres to administer it, cannot hope to contend against one which has them. I should here like to state an opinion, which I know is held by many officers who have seen Swiss manoeuvres, a thing which I remarked myself nearly twenty years ago, namely, that in the Swiss Army it is the senior officers who have not that knowledge which constantly being with troops and devoting themselves to military affairs gives to men, and which you will never get in the mere amateur or officer of short service. Therefore, it always seems to me that, if we are to have a National Army, as I hope we shall, that National Army must have some system by which its cadres, both non-commissioned officers and officers, shall be trained men, capable of leading the less disciplined men into action. It is a peculiar fact in England that as we descend the military scale, less and less instructed are the officers and the non-commissioned officers. The contrary ought to be the case; and whoever starts a National Army ought to bear this in mind, and see that this state of things is altered. After all, it does not take an enormous time to make a soldier. German recruits who come in in November march out in March. If Germany goes to war, they have men, it is true, in the battalion of somewhat longer service, and they have a large proportion of reservists. Like the reserve in England, the men who help to complete the Army when it goes to war. The lecturer alluded to relief during embodiment; but relief during embodiment is what the Boers tried and what the Americans tried in the war of the North against the South, and in both cases it was found to be highly inconvenient, at any rate to the military administrators. When once war is declared the men whose duty it is to serve with the colours cannot go away until after the war is ended. That must be recognised in any organisation we take up. Of course, we all know that a compulsory Army is cheaper than a voluntary one. You have to give inducements in the one case that you need not give in the other. The men have to take what you give them. The inducements a hundred years ago took the form of a very large bounty; they took the form in the last war of giving five shillings a day to the men who went out with the second batch of Yeomanry—I do not think with a very successful result myself. There is no difficulty in officering the Army with compulsory service. The difficulty is when you have not compulsory service. It is a difficulty which is being felt in England at the present moment, notwithstanding certain optimistic statements made in the Press by those who ought to have known better than to make them. A point I suggested twenty odd years ago in our old hall was that the proper method for raising an Army is to make it national to begin with. Our experience shows that men who join the Volunteers and the Militia often enlist from those into the Regular Forces. I think myself that if we were to start by making the basis of our Army a national one, we could easily get enough men from it for our ordinary requirements, i.e., garrisons abroad in peace time. I believe more, that the officer of the Regular Army should start by being an officer in the Auxiliary Forces. I think that no man should go into the Regular Army as an officer unless he has served as officer in the Auxiliary Forces. You cannot fill up the officer ranks in the Auxiliary Forces at the present moment, because there no longer exists in England the class of man who can afford to give up the time to those duties without some inducement. If you catch them young and get them in as Auxiliary officers, even if they fail to go into the Regular Army afterwards, many will stop on in the Auxiliary branches. The only inducement you really can give is the possibility of obtaining a commission

in the Regular Army from the Auxiliary Army, and this should be the only road to a Regular commission. I am quite sure that for raising a National Army, localisation is everything. The stronger the tie between the regiment and the locality in which it is raised, the better it is for both the locality and the regiment, and this should form the foundation of our future military policy. Finally, we must remember this: We are at the parting of the ways—we have either to find some means of getting what military strength we need, or we shall have our present position taken from us. It is no good talking nonsense about the Volunteer being better than the Regular. I should like to know whether the conscripts that fought for Napoleon fought worse than the men who fought for England, or whether the Prussian and German soldiers who fought in the Franco-German War were not just as good as any Volunteer who ever stepped in shoe-leather. The saying is unmitigated nonsense, and is merely a convenient expression we put forward to excuse ourselves from our proper and just duties. We are becoming in sport a nation of on-lookers. We look on at cricket and we look on at football, and we look on at the Army. If we continue looking on we shall get no Army. Those who have studied and thought over this matter know well what will then be the end of England.

Colonel F. D. V. WING, C.B., R.F.A. :—The most excellent lecture which has been delivered by Major Johnson has raised in our minds visions, in a responsible future, of a great national army based on a Militia system. I should like to say a word with regard to the efficiency of the Militia, as I hold the rather unique position of a Regular officer in command of a Militia unit—that is a brigade of field artillery. After the experience of one year's training with them, the admirable and excellent work done by all ranks assured me of their efficiency to such an extent that I should have the greatest pleasure in taking them on service to-morrow. When I say that, I do not want it to be understood that I would take with equal confidence a Militia unit which had not received adequate training. I think, in the idea of such a national army, a very important point is the training which is necessary to enable the men to come up to the proper standard. My brigade trains for fifty-six days every year—eight weeks. That is much longer than could be expected from any Militia on a large scale; it would not do for recruiting purposes, and it would not do as far as finance is concerned, for finance governs all these questions. We have to think of the minimum training which it is necessary to give our Militia to qualify them either for the duty of a great national army, or their present duty of being a first reserve. I call them the first reserve as, though we have an Army Reserve, that Army Reserve would be fully taken up in order to complete Regular units on mobilisation. Our first national reserve is to fill up wastage during war. In order to qualify them for that position they ought to have a sound technical instruction, both in drill and in tactics. The lecturer referred to what he called intermittent training, that is, drills carried on throughout the year near the homes of the Militiamen. Our Militia, as at present constituted, are not able to undertake intermittent drills because they live too far apart; they cannot be collected. But our Volunteers can do it. The Militia of Switzerland can do it, the Militia of Canada can do it, but our Militia are unable to do it. It may be possible in the future, when they will be organised territorially. But we must not let the brilliant prospects of future possibilities dazzle our eyes to the necessities of the present, and that is to train our Militia up to the mark in order to meet the present

conditions of service. The present training of Militia consists of recruit training and annual training. The idea is, by increasing the recruits' training to diminish the annual training. There is one point about that to which I should like to draw attention, that the recruits' training is generally carried out at depôts, which are of necessity in large towns, and where there are no facilities for training as regards tactics. I maintain that three or four weeks of barrack square training is not of such use as a single week's training with an embodied unit at places where full tactical facilities exist to give them proper tactical instruction. As regards that point I think they should have about twenty-eight days every year for their annual training. I look upon that as the safe limit below which it is not safe to go. There are, of course, questions of recruiting and finance to consider, but we must not attempt a training which we do not consider will qualify our men to be efficient soldiers. I say that without any wish to demand that the bodies and souls of our fellow-countrymen should be sacrificed upon the altar of military despotism (with reference to a remark in the lecture), but solely to maintain that our Militia should be trained to such a pitch that when called upon they will not be a rabble but a body of properly trained men.

Mr. GEORGE F. SHEE :—I have looked forward to the lecture to which we have listened this afternoon with extreme interest. I knew very well that the lecturer was a man of great ability, and one who had given much time and application to the study of our Auxiliary forces, and who had done much to contribute towards useful discussion as to the best means of rendering them efficient for the purpose for which they exist. I also knew that he had been attending the Swiss manœuvres this year, and I looked forward with extreme interest to hear the account which he was to give to this Institution of his impressions of those manœuvres, because I knew that no honest man could see the Swiss Militia system in action, examine it in all its details, see the spirit of the people upon which it rests, and be unconvinced that that system is a sound one, that it gives an efficient Army, and that it gives it on an economical basis. I looked forward, therefore, to hearing this lecture, because I wanted to see how anyone could get away from the conclusions to which he must inevitably be driven, namely, that if we want to have a national reserve upon a truly national basis, if we want to have it on an economic basis, and if we want to have it consistent with the avocations of industrial life, and with the ideals of democracy, we have no choice before us but to adopt the system of universal training as it exists in the democratic nation of Switzerland. I have listened to the lecture with great interest again, because I noted the perfect honesty with which the lecturer dealt with the admirable qualities of the Militia which he had gone to inspect. He had no fault to find with it as far as I could see. He noted the high physical standard of the men, the admirable discipline with which they were organised and moved, the ready spirit and alacrity with which they accepted the obligations imposed upon them as a nation. The perfection of their organisation down to the smallest detail, the fact that even their highly civilised arms, the artillery and the engineers, were well and efficiently filled, he gives his approval to all these things with warm admiration. What, then, was the conclusion to which he came? What could prevent him coming to the conclusion that this nation must adopt the same principle if it wishes to have the same result? I confess I cannot see in his lecture any reason why he withholds his recommendation of the system to us. He puts forward what I think is rather a sophistical

argument when he says that this splendid organisation is not the result of a compulsory military system, but the result of a national spirit. But, I ask you, how has that national spirit manifested itself, if not by this fact, that this democratic nation, in which universal suffrage exists, has taken upon itself in the person of its manhood the duty of national defence? I cannot see how you can get away from that result. It is no use talking about these things not being the result of compulsory military training. Do they exist in any other nation without compulsory training? That is the question I have to ask. If we wish to have the end we must desire the means; it is no good saying that our conditions are quite different, and that we must make our system fit in with the individual convenience of every single man, giving one man the opportunity of rifle clubs, another man the Volunteers, another man the Militia, and another man the Yeomanry. Can we secure a homogeneous, economic, and sound system, giving efficiency in time of war, on such a basis? I do not think it is possible. It has been tried for a hundred years; it has been tried by successive War Ministers, who have constantly appealed to prejudice—I might almost say to the gallery—in saying that they would not dragoon the country into accepting the principle of national duty, that they would not accept the system of compulsion in this country. They have talked of militarism, and they have raised every kind of bug-bear which they thought would prevent the people from accepting the principle which they know should be accepted. But what has been the result? Can anybody say that our national forces at the present moment would stand the test of war in any respect?—I refer to the national reserve forces. I know that the Regular Army has enormously improved in efficiency and organisation since the South African War, but if we look to our national reserve forces, we find there is not a single one of them that is not thousands of men below the establishment, there is not one of them that has not thousands of men who are incapable, on physical grounds, of fulfilling the duty for which the country pays. There is not one of the forces which is at the present moment efficient for war, and I do not think I shall be contradicted in that. Now I ask you, if the lecturer has shown us this afternoon in his admirable lecture, a nation accepting the principle of compulsory military training, and producing a Militia Army which is the envy of many nations in the world, producing one which is praised by all the experts—and I have read the opinions of French, German, and Russian and British experts upon that Army, and they agree fully with that of the lecturer, that it is ready for war—if they have produced it on that system, what are the mysterious reasons why we should hope to secure efficiency on any other basis? I do not believe that we shall secure it by waving the flag of Voluntarism, and telling ourselves that we have some peculiar qualities which will enable us to muddle through under the conditions of modern war, and on principles which every other modern nation in the world has abandoned. The United States has been mentioned. I thought it unnecessary to refer to the instance of the United States, though I suppose it is always necessary to state it; but it is perfectly obvious that the United States are in quite a special position. They are thousands of miles from any possible aggressor, they have enormous resources of wealth and manhood, and if a war were to come, when they had to face the aggression of a nation thousands of miles off, they would certainly have a considerable time to prepare. But let me remind you that the time when they had to fight, when they fought for a principle—and do not let it be supposed that any "peace at any price" shibboleth will prevent us from doing so—

they were driven, after trying the voluntary system, into accepting the principle of compulsory military training. Let me also remind you, as the United States has been mentioned, what it cost the United States to wage that war, because they did not start on the basis of a compulsory training. I think I am right in saying it cost them something like a thousand million sterling, and it cost them many, many thousands of lives—300,000, Dr. Miller Maguire tells me—and it also cost them four years of waste, and war, and rapine, and plunder. That is an example of the results of the voluntary system adopted by a nation, and is not one which is full of encouragement. I will not detain you longer, but I should like to say this in conclusion. The lecturer has asked the Chairman to look to "the shining example of Switzerland" in preparing to give this nation a sound organisation for a National Army. I wish very much that the Chairman was still here, because I should like to add another appeal, and to ask him to look to Switzerland not merely from the outside, but to look to it as regards the spirit which animates the people, and which has made it possible for Switzerland to produce that system. I cannot help thinking, sometimes, when I hear people say that they wish to have a National Army of high efficiency, and a cheap army, but that they will not be "dragooned" into military training, that they will not have compulsion on any terms—I cannot help being reminded when I hear such statements of a most delightful play, which I expect the majority of you have seen, "Peter Pan." You will remember a scene in that play where the small boy Michael rides in on the big dog Nana, keeps crying out: "Nana, I will not be bathed; I tell you, I will not be bathed!" He knows perfectly well that, in order to be clean, which he certainly wants to be, he has got to be bathed, but he reiterates his solemn determination not to have anything to do with hot water. I believe that those who constantly reiterate the same determination, not to adopt the principle of compulsory military training, will sooner or later find themselves compelled to take their bath; because it is only on the principle accepted by all modern nations (I except the United States, if you like, though it is on the Statute Book of the United States that every man in time of war is compelled to serve the State)—unless we accept the principle that has stood in good stead to every modern civilised nation—we are bound sooner or later to lose that predominance and that position which we all hope to maintain.

Admiral Sir NATHANIEL BOWDEN-SMITH, K.C.B.:—Although the question before us concerns entirely the land forces, I hope you will not think it out of place if a retired sailor, and one, perhaps, of the "accursed Blue Water School" which we have heard of, ventures to say a few words in this discussion. Really, the principal reason why I wish to speak is to heap coals of fire on the lecturer's head, and to say with what great pleasure I listened to his most interesting paper; and secondly, I wish to express my entire sympathy with my brother officers in the sister Service in the efforts they are making to try and make the country show the absolute necessity of having an efficient and sufficient reserve for expanding the land forces. As a sailor I am naturally one of those who give way to no one in thinking that the Navy must be our first consideration. We must have a fleet equal or superior to that of any other two European Powers; but the Navy alone does not suffice for all the requirements of the British Empire. It never has done so in the past; it never can do so in the future. If we look back to the late South African War, for instance, we had then complete command of the sea.

Our sea supremacy was never challenged, and yet we came dangerously near to losing South Africa. And what was the reason? Because, in the last year of the war, at all events, we were sending out men hastily recruited in the streets of our cities who never had any military training at all, and many of whom had never had a rifle in their hands. Now, of course, it is quite impossible that this country can keep up a big Army as well as an all-powerful Navy; and, therefore, the more reason why we must have some means of extending our land forces in time of emergency. It is not for me to say how that is to be done; it is a military question. But it seems to me there are only two ways. One by increasing and reorganising the Militia, and making it available for foreign service, or by having some system of compulsory training, because I think we must have a Volunteer Army for India and other oversea places. And this national training should first of all take place in our schools—all classes of schools. Secondly, I should like to see it enacted that every able-bodied man in his early manhood should have to undergo some short course of military training, a training which need not in the least interfere with his future career, whether he was going into one of the learned professions or whether he was to be a tradesman, artisan, or labourer. If our young men were brought together for a short time in their early manhood, and rubbed shoulders together with other classes, it would often do them good service. It would sharpen their wits, and enable them the better to take part in after life in that great competition which is growing keener every year. It would improve the carriage and appearance of our young men, and the national physique. It would teach habits of order, of cleanliness, and discipline; it would bring classes together and make us sympathise more with each other. I do not wish to imply that the feeling is bad at present between the classes in England—I believe it to be fairly satisfactory—but I say it would make it better. Above all, I believe such a system would tend to inculcate a true feeling of patriotism—I do not mean that empty windbag sort of stuff, which tends to the waving of flags and singing of bellicose songs in music halls—I refer to that real feeling which makes everyone desire the true welfare of his country, and makes him feel his own sense of personal responsibility towards it. Something of this sort will have to come, and when people say that the nation will not have it, we must remember that the nation has never yet been asked. I believe if any Government had the courage to put the question before the people, and tell them that it was necessary, they would certainly consider it seriously. Unless we are prepared to submit to some self-sacrifice, and to make preparation for any emergency which may occur in the future, I cannot see how we can expect to maintain our position amongst the nations of the world.

Lieut.-Colonel W. C. UNDERWOOD (late 4th Hussars):—The speakers who have spoken on so many other subjects besides that of the question of the National Swiss Militia have taken up so long a time that I do not wish to keep you more than two or three minutes. I happened to be six months in Switzerland this summer and I took a great deal of interest in making enquiries and going to see various things connected with the Swiss Militia, and consequently I listened with the greatest interest to Major Johnson's lecture, in all of which I entirely agree, except in his closing sentence, where he stated (although I saw through all his remarks he was in favour of a national general compulsory training as it is in Switzerland) that England was not yet ready for it. Admiral Sir Nathaniel Bowden-Smith said just now, with truth, that the question has never

been fairly put before the electors. Whenever I have addressed or spoken at any public meeting in a country place, I have always met, especially among the working classes, with a most enthusiastic reception when I spoke in favour of compulsory service. I got introductions to three officers in Switzerland: to Colonel Nestlé, the head of the Swiss Milk Manufactory; Major Bonnard, the head of a large establishment at Lausanne; and Colonel Sarrazin, a large employer of labour. I asked all three of them the same questions. My first question was whether compulsory service, as in Switzerland, was a serious loss or disadvantage to the carrying on of their business during the times of the training. My second question was whether if that were so they took any steps to alter or make any provisions against it. I received the same answer from all three officers, namely, that no doubt during the manœuvres, which took place every second year, there were considerable difficulties to put up with on account of the loss of their men, but that they engaged always a certain number of older men in their factories who were not liable for service, and that they all put their shoulders to the wheel and did the work while the younger men were away. They say: "We cannot grumble about this, because if we did so we should be considered unpatriotic and lose caste with our fellow-countrymen." The answer to the second question, as regards what steps they took, was that they permanently engaged a proportion of the older men and put them in the places of the younger men. It suddenly struck me that that might be the solution—to some extent—of the "unemployed" question here. If we had compulsory service in this country, when the Militia were called out for their training, the older men, who are the first to be unemployed in bad times, would be taken on and employed in the factories where the younger men worked. That, I think, would be a good solution to this question of the unemployed which crops up year after year. Then I saw Colonel Camille Favre in Geneva, whom I daresay the lecturer knows very well. I had a talk with him which impressed me strongly. He said he believed that the great majority of the people in England, especially those connected with the Army and Volunteers, were in favour of universal service. He said: "I have had long conversations with many Liberal and Conservative members, all of whom are in favour of it. They say they do not like to speak about it in case they might be turned out of their constituencies." That is what Colonel Favre told me. He kindly gave me the order to go and see several of the dépôts, which the lecturer did not specify very particularly, but which astonished and pleased me very much. Everything was perfectly new. There were no obsolete 40-pounder muzzle-loading guns; everything was of the very latest pattern. There was a corps of armourers who looked after the arms and kept everything perfectly spick and span and clean. There was a staff of sentinels who did sentry-go night and day in case of fire along the passages and galleries. Not only that, but at the end of every gallery there were several fire extinguishers, and the sentries were ready to give the alarm in case of fire. There is very little chance of a destructive fire taking place there, as was the case the other day at Portsmouth. With regard to what the lecturer said about the schoolboys not having any physical training except with clubs, I think there is one point in connection with that from what I saw at Vevey, which I think I might bring out. There is a school of about 300 boys there, and I went one Saturday afternoon to see them at their games. I did not know what they were going to do. Their game, instead of being "rugger" or "soccer" was a game of a regular field day. There was a shed from which they pulled

out some miniature field guns which they had had made specially for themselves. They had a sheltered trench drill for one company and other companies attacking, and a march past afterwards before the head master, who was a major in one of the Militia regiments. I do not know whether it is done in other schools, but at this school at Vevey there were 300 boys whose games were sometimes of an entirely military nature, and they struck me as being rather more important and useful for their country than the games we have here.

Colonel H. C. B. SIMPSON, C.M.G., R.A.:—I had not intended to speak at all to-day, but it seems to me that the lecturer and those who have alluded to one arm of the Swiss Service have perhaps painted it in too rosy a colour. I had the privilege this summer of being attached to an army corps of the Swiss Army, and, being a gunner myself, I watched the working of their artillery very closely. All the foreign officers and the senior officers themselves of the Swiss Army considered, I believe, that the artillery is the least efficient of all the arms, and it is a service about which they are most anxious. They were armed then with obsolete artillery, but, as the lecturer has told us, a new gun is being produced, though it was not then in the Service. Their great anxiety is, as to whether they will be able to give enough training to their men in order that they may master all the technical points and workings of this new weapon. The detachments work very well round the guns, but as regards fire discipline and fire tactics, such as we understand in our artillery to-day, it is almost practically non-existent. The brigade and battery commanding officers are especially wanting in sufficient higher training. The spirit is there, but they have not the available time at their disposal. Consequently, the units as such are not very efficient. The horses are hired, and, therefore, the driving and fitting of the harness is what one would expect, rather indifferent as a rule. In taking up positions the batteries never supported the close infantry attack at all, and, although they brought their guns into very difficult positions, they could certainly not have retired from them, with the result, that had those positions been taken up in war and captured, they would have lost the whole of their guns. I only mention these facts, because otherwise officers present might have left the Institution with the belief that the artillery is a most efficient arm in the Swiss service, which I don't think is quite the case according to modern ideas; and we all know the danger of second-best field artillery.

Major R. A. JOHNSON, in reply, said:—At this late hour of the evening it is only necessary for me to make a few observations. I was very glad indeed to hear the Secretary of State for War say that we must not overdo the idea of a Volunteer Reserve. There was a rumour at one time that economy was going to be effected by forcing members of the Auxiliary forces to retire at an early age, and to pass them into a reserve. I am glad to find that this plan does not meet with Mr. Haldane's approval. The great point about the Swiss system is, that it prefers intermittent training spread over a longish period of years, and the consequent retention of the men with the colours for a long time, to the usual continental plan of cramming all the training into a year or two at the beginning, followed by a long service in the Reserve almost without any training at all. Then there is the question of compulsory service. I know I am in a large minority on this subject amongst those present to-day; but then, you see, I am not a soldier, I am merely a civilian, and I must say that I am convinced that if we had a plebiscite

to-morrow, however desirable it might be, we should not get compulsory service. I am asked why I do not advocate compulsory service. I think the answer is very simple. First, because I am not a dictator, and, as far as I know the Secretary of the National Service League, has not been appointed Lord High Dictator of England either. We are governed by a Parliament, and the fact remains that no leading politician of either party would dream for a moment of introducing a Bill in favour of compulsory service. This may be highly regrettable, but it is the fact; consequently, it is not at present practical politics to say that there is no solution for our military weakness except universal service. Secondly, and I think this is a most important point, there is a tendency amongst people who argue for compulsory service, to discourage the voluntary efforts that are being made by many thousands of patriotic people at the present time. Now that, I think, is an extremely dangerous position for the advocates of compulsory service to take up; in fact, it is an absolutely downright unpatriotic one. Of course, there are a great number of people who are in favour of universal service, who are also strong supporters and leaders of the existing Auxiliary Forces; but I observe that a great number of those who cry loudest about national service at public meetings have never held a commission in their lives in the Auxiliary Forces, and never thought of doing so. How can they expect in a democratic age like the present that the British people are going to listen to them unless they themselves set the example? Believe me, they had much better come and put their shoulders to the wheel with us of the Auxiliary Forces, and do their level best to make Mr. Haldane's coming scheme a success, than go about wringing their hands and crying for legislation to compel them to do what they are unwilling to do of their own accord! Finally, I do not consider that in this country we do want everybody to serve. Universal service is all very well for France and Germany, but I cannot see how our strategic and political situation demands the service of every man. It may be desirable on other grounds, moral discipline, physical improvement of the men, etc., but on the military ground alone we really do not want everybody; and, therefore, if out of those who are willing to come, we can get a sufficient number of good men to man the National Army of our needs, why should we force a number of people, who do not want to fight, to go into the firing line? We would much sooner be without them. As regards national training in schools, the physical drill to which one speaker referred as a desideratum already exists in the schools of this country, it forms part of the general curriculum demanded of the Board of Education as a condition of the payment of grants. But this training is purely physical, there is nothing distinctively military about it. In dealing with the Swiss system, the point I wanted to make clear, and which I think is an important one just now, is, that the Swiss Government do not encourage compulsory training of a military character in schools. Gymnastics? Yes, by all means; this continues to be obligatory in the Swiss schools, and there are additional voluntary exercises for those who are between sixteen and twenty years of age. But it is a unanimous view of the Swiss Authorities that compulsory military training should be reserved for grown men. In England, because we cannot get compulsory service for men, that does not seem to me to give us any excuse for adopting the extremely cowardly alternative of forcing the unfortunate boys who have got no votes, and therefore no voice in the matter, to undergo a military training which the men who have the votes refuse to undertake themselves. Boys cannot be driven any more than men, and the only result of such a

measure would be to sicken our boys of anything to do with soldiering while yet in their teens, and so defeat our object, which is not so much to have a mob of drilled men in the country, but a sound army of serving soldiers. Meanwhile, those of us, who are in favour of doing some practical service at once, and of persuading, not compelling, others to do the same, are not altogether antagonistic to the theory and principle of compulsory service. We wish well to those who are willing to go, like John the Baptist, into the wilderness and preach the principle of the duty of every man to serve the State in arms, provided that when they are so preaching they do not vilify those who are trying to do their best under present circumstances, and provided that, if and when a new scheme is propounded, for trying to make a National Army on a voluntary basis, that scheme is not pooh-poohed and put aside simply because there is no compulsory element in it. If a scheme is produced for giving the voluntary principle a serious trial, I very much trust that the advocates of compulsory service will put their theories in the background and lend a hand to the wheel to see whether the voluntary principle can be made a success. Colonel Wing, who is an officer of very great experience in artillery work, has just told us that he believes that even so expert an arm as the artillery can be well served by Militia gunners. We know that that is a very thorny question just now. Some think it possible, others do not. Mr. Arnold-Forster, in his book, puts the position, I think, extremely fairly, but even he does not venture to express a decided opinion. The question is an open one; no one can pretend to decide it one way or the other, until it has been put to a practical test. But as there is now a good body of opinion in favour of making the experiment, by all means let us make it. The Swiss believe that they can supply all branches of an Army efficiently under a Militia system. That is also my own view, and what is more, I believe that our own people are so constituted that you are more likely to be successful with a voluntary Militia than a compulsory. It is idle to say that the voluntary system has failed, it has never been given a fair trial.

Since this lecture was delivered, the new proposals have passed the various legislative bodies of Switzerland, and now only await the final approval of the people by Referendum in July next. There is no reasonable doubt that the Referendum will approve them.

The proposed periods of training for corporals, lance-corporals, and privates have now been revised and are as follows:—

Recruits' Course.	Elite.			Landwehr.			Grand Total.
	No. of Courses.	Days.	Total.	No. of Courses.	Days.	Total.	
Infantry 65 (<i>45</i>)	7 (<i>5</i>)	11 (<i>16</i>)	77 (<i>80</i>)	1 (<i>2</i>)	11 (<i>5</i>)	11 (<i>10</i>)	153 (<i>135</i>)
Cavalry 90 (<i>80</i>)	8 (<i>10</i>)	11 (<i>10</i>)	88 (<i>100</i>)	None	None	None	178 (<i>180</i>)
Artillery and Fort-ress Troops } 75 (<i>55</i>)	7 (<i>5</i>)	11 (<i>18</i>)	77 (<i>90</i>)	1 (<i>2</i>)	11 (<i>6</i>)	11 (<i>12</i>)	165 (<i>157</i>)
Engineers 65 (<i>50</i>)	7 (<i>5</i>)	11 (<i>16</i>)	77 (<i>80</i>)	1 (<i>2</i>)	11 (<i>5</i>)	11 (<i>10</i>)	153 (<i>140</i>)
Medical, Veterin-ary, Supply and Transport ... } 60 (not definitely fixed)	7	11	77	1	11	11	148 (not definitely fixed)

The old periods at present in force are printed in italics.

THE SWISS MILITIA AS A MODEL FOR FRANCE OR ENGLAND.

The following extract from *Vers un Nouveau Sedan*, by M. Driant, which applies equally in England as in France, has been sent us for publication :—

M. Jaurès said lately, in speaking of a possible war between France and Germany, that if the French Army were beaten, William II. would find behind it the French people to deal with—like the Volunteers of 1792.

His remark was received with enthusiastic applause. The writer, Commandant Driant, could not accept this, and when his turn came to speak, he said :—

"No, Mons. Jaurès, the people, the Militia of your dream, will not stop the enemy; the German Army of to-day, which I have just been seeing, would walk over your popular laires as an engine runs over sheep straying on the railway. 1792 is long past. The spirit of that time, even if it still existed, which is doubtful, would not affect the attacker, and it won't be by tossing their hats on their bayonets and shouting 'Hurrah!' that the Volunteers of 1907 will stop invasion."

Jaurès retorted by quoting General Langlois' article on the Swiss Militia, and the rôle which that force would play in the defence of Switzerland.

"But," Driant replied, "Switzerland is not France (nor is she England). She has her neutrality guaranteed; comprises only a small nation; her topography is not suited to movement of great armies; and though her Militia is an economy for her, it does not follow that it would be equally economical for us. . . . Instead of proposing what to do on the destruction of our Army, you would do better to see that you do not destroy bit by bit that Army which is the only permanent safeguard for the country. Do not dream about what might be, but look around you and see what IS. Other countries steadily improving their forces and armaments, while our Army is being reduced and put in the melting pot."

THE RUSSIAN SECRET SERVICE IN THE WAR OF 1904-5.

Translated from the *Ruskii Invalid*.

Communicated by the General Staff, War Office, 1907.

IN our previous article, "The Meaning of a Military Secret, and How to Keep it,"¹ we pointed out sufficiently clearly the numerous ways in which we assisted the enemy to obtain information by means of his spies. We will now endeavour to reverse the picture, and to describe the system of secret service as organised by us.

Before enlarging upon the qualities of the Chinaman as a spy, we will first briefly outline his general character.

Our previous campaigns and expeditions should by this time have made us thoroughly familiar with the idiosyncrasies of every Asiatic, and the Chinaman in this respect is no way different from the rest.

In his relations with Europeans, he looks upon the latter as beings of an inferior order.

Though willing enough to enter into commercial transactions, he nevertheless guards his private life with jealous care. He is at heart a man of peace; yet he is cruel, sensitive, and vindictive, especially if an insult is offered to his family. Still, he can be obliging, polite, and even kind-hearted in a sentimental way.

He is a past-master in the art of concealing his intentions; and in his dealings with Europeans he is guided by the aphorism, "A heart of ice, but a honeyed tongue."

He possesses, in a remarkable degree, the faculty of turning everything to account, and it is this lust for gain which makes him always open to a bribe—a failing which assisted us considerably when hiring spies from among the inhabitants.

When organising secret service, one should always remember that complete confidence can seldom be placed in an agent or spy, because in most cases it is exceedingly difficult to make sure of his trustworthiness.

Shrewdness, alertness, perspicacity, and a wide knowledge of human nature are the qualities essential to anyone who is entrusted with the duty of organising secret service. He should, moreover, possess that peculiar faculty which enables a man to grasp the situation instantly after perusing a mass of collected reports.

¹ Note by Translator.—This article did not appear in the *Ruskii Invalid*.

The degree of confidence which can be placed in a spy depends, naturally, on such considerations as to whether it is to the advantage of the inhabitants to serve one's interests, what opinion they may hold as to the strength of one's forces, and what are the motives which have induced the man to adopt the hazardous calling of a spy. The last-named consideration is a *sine quâ non*.

It is safe to say that at the commencement of the campaign our relations with the Chinese were such as to lead us reasonably to expect them to serve us more willingly than they actually did.

The recollections of 1894-5 were still fresh in their minds; they were one and all thoroughly alive to the aggressive designs of the "Land of the Rising Sun," which had waged war with the "Celestial Empire" for upwards of 1,000 years; and, added to this was the consciousness of the superior might of Russia. Hence, apart from historical considerations, there was every reason for expecting them to throw in their lot with the stronger side. It is a mistake to suppose that racial affinity was in any way responsible for the support accorded to Japan by the Chinese.

The Chinaman hates the Japanese with his whole heart and soul—a feeling which is the outcome of historical traditions, but one which will naturally die out with the spread of civilisation.

We Russians have before us a striking example of a long-standing mutual antipathy between two consanguineous Slav races; but we have reason to hope that it will soon be relegated to the land of fables.

Our long series of disasters, coupled with the far-reaching territorial influence of the Japanese, and their harsh treatment of the natives, tended, on the one hand, to lower our prestige in the eyes of the inhabitants, and, on the other hand, compelled the Chinese willy-nilly to side with the stronger party. China thus found herself in an awkward position, from which there was no way of escape.

With consummate craft the Japanese issued proclamations, declaring that, so far from waging war with China, they had determined to forget the ancient feud, and were only bent on saving her from the incursions of the northern barbarians. Such were the means which they employed to swell the ranks of their supporters, and thus it came about that the native population resolved itself into two distinct factions. On the one hand were the supporters of Japan, who, while equally indifferent to both sides, looked upon the Japanese as their only source of profit in the general ruin which threatened their country, and, on the other hand, were the supporters of Russia who, however, formed a very limited minority.

Another cause of the success of the Japanese secret service was the fact that the closest commercial relations existed between Manchuria and Japan. For instance, in the town of Ying-Kou Japan was responsible for nearly one-half of the imports and exports. Many wealthy Chinese firms, which have branches in all the more important towns of Manchuria, had large financial connections with Japan, and were consequently bound to serve her interests.

Before the war it had been a common practice to send Japanese students from the middle and higher commercial schools in large numbers to Manchuria, and thus opportunities were afforded them of establishing relations not only with the Chinese, but also with the Russian population. As will be seen below, the conditions were

favourable to us, had we but recognised sooner the necessity for organising a system of secret service.

In the Chinese we had excellent material at hand for the making of spies. Being naturally cunning, versatile, intelligent, and indefatigable, inured to a sparse diet, and possessing a high standard of educational qualifications, they could easily have provided us with the cadre for a corps of spies. Unfortunately, however, we had taken no steps to form such a cadre.

As we have remarked above, it is essential, when organising secret service, to know the motives which have induced a man to adopt the dangerous calling of a spy.

After comparing the experiences of former campaigns, we have ventured to draw up the following classifications of the various kinds of spies, viz.:—

1. *Voluntary Spies*.—These are usually actuated by motives of revenge, spite, ambition, etc.

I myself have employed spies of this class. They belonged mostly to the secret societies of Manchuria, and had adopted the calling in revenge for the aggressive conduct of the Japanese. Their numbers were, however, very limited.

2. *Spies by Compulsion*.—Of these we had none, for the reason that humane treatment formed the basis of our relations with the Chinese inhabitants.

The Japanese, on the other hand, had recourse to compulsion in the majority of cases, seizing the family or property of the spies as hostages. Thus they profited by the Chinaman's domesticity, knowing well that so strong was his affection and his jealousy of his family's honour that the confiscation of any members of his household would impel him to undertake the most hazardous and difficult missions.

3. *Professional Spies*.—The majority of spies belong to this class. It need hardly be said that the professional spy is a person of more than doubtful morality. They are generally recruited from among the lower grades of the urban and rural population. It must be explained that many members of this class of spy owed their position to force of circumstances, i.e., they had been driven into the ranks of the proletariat at the bidding of the ruling power in China.

They furnished, however, a willing contingent of secret service agents, which is our justification for the foregoing somewhat lengthy digression.

We have already pointed out the difficulties attending military intelligence work in our articles in the *Voyenni Golos*, Nos. 190, 191, 192, where we also defined the limits of its powers and usefulness.

Our ignorance of the country, the people, and the language, and the want of good maps, considerably impeded our intelligence work, and compelled us to have recourse to secret service as the sole means of obtaining reliable information as to the distribution of the enemy's troops, his points of concentration, the arrival of his reinforcements, etc.

Neither have we the right, nor do we consider it justifiable to discuss in print the working of our secret service organisation. Still, on the other hand, we think it our duty to do so, in order that the mistakes of the past may prove a lesson to us in the future.

How could it be expected that the efforts of our directors of military intelligence could produce successful results without previous preparation in time of peace?

In spite of all his energy, perseverance, and devotion to this most thankless of tasks, the organiser of secret service will find himself forced to rely on the services of chance agents.

A false report sent in by a spy and followed by hasty deductions may produce the most disastrous results. An instance of this occurred in the summer of 1905, when the information appeared in our orders that Nodzu's army had evacuated its positions, and that two of his divisions were marching on Tao-lu.

In the spring of that year, too, equally sensational reports were furnished by the spies of the frontier-guard to the effect that 22,000 hostile troops were advancing on Hai-lar.

A report from these same spies in February, 1905, was responsible for the despatch to the rear of six regiments of cavalry and two of infantry at the very time when we were preparing to repeat the Shen-tan-pu operations!

Our impromptu method of collecting spies necessitated their hasty instruction in the various distinctive military badges, etc., to enable them to recognise the different units.

As soon as a spy had learnt his lesson (and it was no easy task), he commenced work at once.

Without going into details of the organisation and control of our secret intelligence, we have no hesitation in saying that, in spite of these adverse conditions, the results achieved were frequently satisfactory to a certain extent.

Nevertheless, we were confronted at every turn by the necessity for arranging beforehand in peace time a network of spies resident in the country. Doubtless, we were fully aware of the advantages of such a measure, but the idea of it jarred upon our sense of honour, and thus prevented its being carried out.

Considerable blame must, however, be laid at the door of our military administrator of Manchuria for having omitted to secure the services of the Chinese official classes. Much might have been done by a few substantial promises and the judicious outlay of a little money.

The Chinese Government officials, whose cupidity we treated as a negligible quantity, rendered valuable services to the Japanese. We, on the other hand, not only neglected to exercise ordinary supervision over them, but even took no steps to thwart their designs. After our evacuation of Mukden, the *Chiang-chün*¹ of that place was deposed by the Japanese, who installed a creature of their own in his place. It was obvious that the former would have compelled his underlings to furnish periodical reports of all that took place in the districts under their control.

Another illustrative fact was the dismissal in July of the *Fu-tu-tung*² of Pa-mien-chêng for having displayed a favourable inclination towards us. The following is a striking example of the ill-feeling of the Chinese officials towards us:—

The *Ti-fang-Kuan*³ of Cheng-san-tun imprisoned a Chinaman for having assisted us in a matter of the purchase of some cattle.

¹ Chinese Military Governor of a Manchurian province. (Trans.)

² Chinese Military Deputy Lieut.-Governor in charge of a division of a province. (Trans.)

³ Chinese magistrate. (Trans.)

A letter was intercepted, in which the *Chiang-chün* of Kirin informed the *Chiang-chün* of Mukden as to the amount of supplies stored in the private and government magazines in his province.

The staff of the IIIrd Army requested the dismissal of the *Ti-fang-Kuan* of Cheng-san-tun on the grounds of his above-mentioned conduct. The Head-quarter Staff, however, refused the request, alleging that such a course was undesirable just then for political reasons.

The Japanese, on the other hand, as their hold over the country gradually extended, lost no time in turning their backs on the local administration, and had no compunction in ousting the Chinese officials whenever they proved no longer useful.

In this way they managed to combat our secret service, and to place every possible obstacle in its way.

Having the administration in their own hands, and by pressing into their service such Chinese troops as were found in the occupied districts, they had no difficulty in exercising a strict surveillance over the inhabitants.

In June, 1905, they even took a census of all villages occupied by Japanese troops, the headman of each *fang-tzu*¹ being furnished with a special pass. A copy of one of these documents actually came into my possession.

So sharp was the look-out which they kept for our spies, that no Chinaman was allowed on the field of operations without a pass, and natives were arrested on the slightest suspicion. A Chinaman failing to account satisfactorily for his presence in a certain area was handed over without trial for public punishment, which usually took the inhuman form of being buried alive. Small wonder that, in spite of their well-meant efforts to assist us, the number of spies gradually diminished.

We personally adopted the plan of sending out spies in relays, not only with the object of ensuring continuity of work, but to enable us to check the information received by comparing the various reports. There is a certain method of verifying the reports of spies which it is better not to discuss in print; nevertheless, it was freely applied to the Chinese.

Among other devices, it is advisable that spies should be required to produce articles of equipment or clothing belonging to the enemy.

In this connection the following incident occurred to our personal knowledge: A gaiter was brought in to us which had been picked up at Kan-ping-san. According to our interpreter, the marking showed that it had belonged to a certain private of the 1st Company of the 26th Takahira Infantry Regiment.

About the same time a spy arrived at the headquarters of one of our army corps and produced another gaiter, which he had found at Kai-Yüan. The marking on the second gaiter showed that it belonged to the same private of the 26th Takahira Regiment. It subsequently transpired that there existed at Ta-fa a central agency for concocting false information, and for manufacturing articles which might serve as corroborative evidence.

The Japanese were very clever at scattering about fragments of letters, envelopes, wrappers, etc., which, when picked up by our spies, would be taken to this central agency.

¹ Literally—house, i.e., family. (Trans.)

In most cases our spies were too terrified of the Japanese to go about among them. Consequently they had to trust to obtaining information from Chinamen travelling up from the south, or from letters received from that quarter.

On some occasions, notably with the 1st Army, our spies disappeared by the hundred, taking their permits with them.

As we have already pointed out, one of the weakest points in the organisation of our secret service was our neglecting to secure beforehand the services of resident agents in the more important districts of the theatre of operations.

In view of the fact that our plan of campaign was based from the outset on the principle of retiring before the enemy, we ought to have made every endeavour to establish agents in the area which it was our intention to evacuate.

The necessity for this was, however, not fully recognised until after Mukden, when arrangements were made for posting agents in rear of the army in view of a possible further retirement northwards. From this it is plain that steps should be taken in time of peace to establish resident spies in all possible theatres of operations. This, it may be argued, will involve a considerable outlay of money. That may be so; but when the time for action arrives the agents will justify their existence, and even in time of peace some use can be made of them.

To revert to Manchuria. Considerable blame must attach to the military commissioners for having neglected to provide trained spies for the Intelligence Department. There being no cadres of secret service agents, the commissioner found himself in a very difficult position when, as happened after Mukden, he was deserted by his spies.

Consequently, under his direction a special school was instituted for the training of spies—a step which should have been taken at the very beginning of the campaign.

The subjects taught in this school were intelligence duties in the field and the Japanese military organisation.

The idea of starting a school of this kind was unquestionably sound, but, with all due deference to its organisers, the scheme was indifferently carried out.

The chief instructor was a student named S—, editor of a Chinese paper, the *Hsin-wen-pao*. Naturally he knew nothing of the military organisation of our opponents, and was utterly incompetent to instruct in intelligence work.

The school consequently failed to realise the hopes of its founders, and during the three months of its existence it only turned out about 20 spies. At the end of July it was closed altogether. Besides the above-mentioned school, there was a less pretentious institution under the direction of the Commissioner's Department. This produced spies, who after a time began to supply us with really valuable information.

Generally speaking, it was the absence of definite guiding principles in such important work as secret intelligence which detracted so much from its usefulness.

The intelligence work in the field was conducted not only by the Headquarter Staff, but also by the intelligence sections of the three armies, without any attempt at mutual co-operation (for the term co-operation can hardly be applied to such an exchange of sifted information as was the common practice with us).

As a matter of fact, all the information culled from the reports of the various spies was summarised in accordance with instructions from the Headquarter Staff, and was supposed to be promulgated daily. Reports of a special nature had to be communicated by telephone.

It appears that the object of these summaries was an attempt to furnish, not a mass of undigested material, but a number of thoroughly verified and carefully edited facts, which would enable the reader to form, not merely a rough estimate, but a full and intelligent appreciation of the strength, intentions, and movements of the enemy.

In practice, however, the fact of these summaries having to be issued not periodically but daily, caused a certain amount of confusion owing to the simultaneous appearance of a number of different editions, each giving its own view of the situation. Instead of containing nothing but carefully verified facts, these summaries used to be filled with reports from spies to the effect that at such and such a place there were so many infantry, cavalry, artillery, machine guns, etc.

Frequently they would contain sensational rumours, often based on a scrap of torn envelope, as to the movements not only of units but of entire armies, as, for instance, the report of the withdrawal of Nodzu's army to the reserve, and the appearance of his 6th Division in the neighbourhood of Tao-lu.

One cannot, of course, deny the importance of such documents, but they should be treated with the greatest discretion. In support of this we can recall instances in which information based on documentary evidence appeared in a summary one day, and on the following day it was contradicted on similar evidence.

It seems, too, that in ordering summaries to be issued, the Headquarter Staff was actuated by a desire to keep not only all other staffs, but also all units informed as to the course of events. Troops, however, require only deductions, without having to follow out the whole train of thought which influence the mind of the compiler of the summary. What they want are facts, and not suppositions.

The regimental officer does not gain much by being told one day that at such and such a place there are so many Japanese troops, and the next day so many, and so on.

Summaries of this kind, with their sensational items of information, only tend to give the reader a false impression of the situation, and, moreover, shake his faith in the accuracy of the information possessed by the Staff regarding the enemy. As soon as a hasty deduction is communicated to the regimental officer, it at once excites his imagination and fills his mind with erroneous impressions.

In the general nervous tension which prevails in war, men become peculiarly sensitive, and are easily influenced by what they hear and read, in view of which psychological fact one has to rely on the apparently simple, but really vastly important, work of the Intelligence Department.

Unfortunately, as we have already shown, there was a lack of co-ordination in the work of the various intelligence branches; in fact, they even used to vie with one another in the amount of information collected. Great results might have ensued, if only the "water-tight compartment" system had given place to universal mutual co-operation. Every officer directing an intelligence section ought to have known the exact number of spies employed by the neigh-

bouring sections, the object of their missions, and the hour at which they were sent out.

An exchange of spies should have been effected in order to check their reliability and the accuracy of their reports.

It happened occasionally that spies worked simultaneously for several different staffs, but no steps seem to have been taken to prevent this. We personally used to photograph our spies and give copies to the staffs of the different army corps—a plan which is recommended for universal adoption in future. Besides the Headquarter Staff, the intelligence work in the field was supervised by various other individuals, such as commissioners, transport officials, frontier guards, etc.

Owing to the distance of many of these centres of control from the advanced positions occupied by our troops, the information furnished by the spies was usually late in reaching them.

It would have been better if these officials had merely provided spies for the staffs—an easy task for them considering their intimacy with the inhabitants.

One of the chief causes of the unsatisfactory working of our secret service, and also of the military field intelligence, was the fact that we were operating in a country with the language of which we were absolutely unfamiliar.

A yet more serious obstacle was the absence of competent interpreters. Such as we had were mostly natives, the majority of whom were persons of limited intelligence. They were consequently only suitable to act as guides, or as intermediaries between the troops and the inhabitants in matters of purchasing supplies, etc. In the latter capacity the Chinese interpreter would transform himself into a Chinese Government official, and look after our interests by forcing bargains from the inhabitants and pocketing a substantial commission.

Both during our halt on the Sha-ho and after our evacuation of Mukden, the Headquarter Staff claim to have discovered that some of our interpreters were in the pay of the Japanese.

Personally, we cannot own to having experienced anything of the kind, but, nevertheless, certain recent events speak for themselves.

A serious obstacle to our intelligence work was the fact that the Chinese interpreters had absolutely no knowledge of the organisation of the Japanese forces or of technical military terms.

We ourselves were fortunate in chancing on an interpreter, a Chinaman, who was a man of considerable education, and who knew both Japanese and English.

Through the medium of these languages we were able to acquaint him with the Japanese military organisation and, with the help of a Japanese interpreter, we taught him several Japanese military terms.

The number of Russians who knew Chinese was very limited, and comprised a few officers who had served some time in the Far East and some of the rank and file of the Cossacks.

Among the latter were many Buryats, who could easily make themselves understood by the Mongolians.

The knowledge of Chinese and Mongolian which persons of this class possessed was confined chiefly to the language of the country-folk.

As for the *Kuan-hua*, i.e., the official language spoken by the officials and educated classes, they neither knew it nor could they learn it, and the same may be said of Chinese caligraphy.

The need for educated interpreters was recognised long before the outbreak of the war.

In 1899 an Oriental College was opened at Vladivostok, and invested with the status of a first-class educational establishment. The necessity for having a certain number of Russian officers with a knowledge of native languages was also recognised, but unfortunately the number permitted to enter the college was, if I mistake not, at first limited to two.

It was, however, subsequently increased, and in 1904 the number of officer-students was ten.

We have no statistics at hand to enable us to estimate the number of officers instructed in each language, nor can we tell how many were furnished by the college to the field army, or to what extent they had been instructed, since we had no opportunities of meeting any of them. Our information regarding the course of studies pursued at the college is derived solely from student-interpreters, for whom appointments were found in most of the army corps.

Some of these had only completed one course of study, but others had undergone two or three. Their services were of little value owing to their utter want of training in military intelligence work. For the same reason neither could the experts in the Chinese language give the simplest directions to their spies, nor could the professors of Japanese interrogate a prisoner properly. The former were sometimes unable even to make out the contents of Chinese documents, and they never could read them when written in cursive characters. In the colloquial language many of them, it must be admitted, had attained a high degree of proficiency.

As regards the Japanese experts, awkward situations frequently occurred, as when a prisoner, on being interrogated, would stare in perplexity instead of replying. This naturally was not conducive to a thorough examination. The students, being ignorant of military technical terms, only confused the prisoners with their questions, so that the answers of the latter frequently missed the point. Besides, an examination can only produce good results when the prisoner, even though unwilling to disclose a piece of information, is involuntarily compelled, by skilful questioning, to give the desired answer.

The students experienced difficulty in deciphering Japanese manuscripts, too. Thus it appears that, judging by the specimens with whom we had opportunities of working, the course of instruction at the Oriental College leaves much to be desired. The truth of the aphorism, *si vis pacem, para bellum*, was apt to be disregarded by us before the late war. In future, however, we must turn our attention seriously to everything that is in any way connected with preparation for war. One of the most important points to be considered in this respect is the necessity for securing to ourselves the services of an adequate number of suitably trained interpreters, who will be able to assist in organising an extensive system of secret service.

The Oriental College should be thrown open to a large number of officer-students. In every unit quartered in the Far East there should be at least one officer possessing a knowledge of Japanese and Chinese. To arrive at this it would be necessary to send annually to the college one officer per brigade, so that in course of time there would be a considerable number of interpreters available for employment with the troops.

At the same time, the course of instruction in Oriental languages should be made more generally attractive. As it is now, the officer-students undergoing it scarcely know how to fill up their spare time.

It would not be amiss to include in the curriculum a course of instruction in the statistics of China and Japan and in the military administration of those countries.

Previous to the late war the sole object in sending officers to the Oriental College was to provide a highly-trained contingent of specialists to fill posts in the military administrative departments in the Far East. These requirements could still be satisfied if the system recommended above was adopted, for in that case the most successful students could be selected for such posts according to their abilities, while the remainder could be attached to units of the Army.

Personally, I consider that a knowledge of Japanese, Chinese, and English is indispensable for every General Staff officer serving in the Far East. But, apart from this, a certain number should be sent annually to undergo a course of instruction at the Oriental College. Even in European Russia facilities should be afforded to General Staff officers to study these languages, if they wish, as part of the course of instruction in Oriental languages.

Shortly before the close of the war, Colonel Linda, who had lately been appointed military commissioner of the Hei-lung-kiang province, raised the question of founding a school for non-commissioned officers and men for the purpose of studying Chinese. I have not heard if the idea was ever carried out, but of its soundness there can, I think, be no doubt. By adopting this system of instructing the rank and file in the Chinese language, we would be able in course of time to establish a special cadre of interpreters, who could be shown as supernumeraries in the various classes of reservists.

Moreover, such a system would relieve the Army of the unreliable and costly service of native interpreters, not to mention the advantage we would derive from being able to deal directly with the native population, instead of having to employ extortionate middlemen.

To summarise the foregoing remarks on our secret intelligence work in the late war, we conclude by attributing its unsatisfactory results to the following causes, viz.:—

1. Neglect of preparation in peace time, both as regards the organising of a network of resident agents and in respect of the training of individuals for the duties of itinerant spies.
2. The absence of a definite guiding plan in the work of the intelligence sections during the war.
3. The complete dependence of the directors of intelligence on the services of Chinese interpreters, who were not up to their work.
4. The lack of qualified military interpreters.
5. Our careless handling of military secrets, to which we have already adverted in our pamphlet, "The Meaning of a Military Secret, and How to Keep it."

Thus we see what a great mistake people make when they try to prove that we grudged the expense of secret service. Nevertheless, to a certain extent they are justified: We did grudge the expense, not, however, during the war, but before it.

THE MILITARY RE-ORGANISATION OF CHINA.

Translated by permission of the French Minister of War from the
Revue Militaire des Armées Etrangères.

Continued from April JOURNAL, p. 464.

THE Chinese Army only possesses special departments at present in a completely embryo condition. Although it can manœuvre decently in close ranks, begins to grasp the mechanism of modern battle, may be provided with European clothing and improved weapons, it could only effectively defend the Empire, when it can dispose of properly organised departmental services, for want of which it could neither move nor subsist. Before, however, these can be provided, much time, money, work, and above all perseverance are needed. The goal is as yet far from being reached.

Department of the General Staff.—The department of the staff is composed at present of young officers who have acquired, either in Japan or the West, either at the old Military School at Tientsin or those at Nankin or Wu-Chang, a general military knowledge superior to that possessed by other Chinese officers, but notably inferior to that of the pupils who come from our own military schools.

The heads of the Divisional Staffs, as well as the functionaries of the *Lien-ping-tchou*, come for the greater part from the Military School at Tientsin, and have passed through the famous division formed earlier by Yuan-Chi-Kai at Hyiau-Yang, a body of troops which has served as the nucleus for the Chinese Army and the nursery for its future commanders. They possess a certain amount of experience, and can be depended upon to carry out precise instructions; but, in spite of their title of "Advisers," they cannot, as yet, elaborate a scheme of preparation for war, such as we expect from our staffs.

This duty requires, of course, much of method, order, and work—habits which have not as yet sufficiently penetrated into the Chinese administration, either civil or military.

The heads and officers of the present staffs will be tied for a long time to come to their German and Japanese *Aides-Mémoire*, and not be fit to meet sudden emergencies in time of war.

The officers of the Staff are assisted by a Corps of non-combatants, analogous to the German *Adjutantur*; one can foresee, when taking into account the Chinese character, that these non-combatants will be gradually charged with almost the whole work of this department.

The quality of the officers of the Staff will improve in a few years, thanks to the appointment of trained men and the passing of the more intelligent candidates through the future Superior War School; but

it is doubtful if it will be for a long time to come comparable to that of Japanese and European officers.

Organisation. — The new organisation makes provision for the following Staffs:—

The Directorship of the General Staff of the *Lien-ping-tchou*.
 The Bureau of the Staff for the provincial *Tou-lien-tchou*.
 Staff of Corps d'Armées (not constituted in time of peace).
 Divisional Staffs.
 Brigade Staffs.

The *personnel* of these different Staffs are divided into two categories:—

1. The officers of the Staff.
2. The Staff Assistants, analogous to the officers of the *Adju-dantur*.

The officers of the Staff have the duty of preparation for war and the study of all questions of interest to the commanding authorities and for instruction. The work of execution is entrusted to the Staff Assistants, who command, at the same time, the headquarters *personnel*.

The hierarchy and assimilation of ranks of the two categories of officers are as follows:—

Officers of the Staff.	Relative Rank.
Chief of Staff of Corps d'Armée ...	General of Brigade.
Chief of Divisional Staff ...	Colonel.
Staff Officer of 1st Class ...	Lieut.-Colonel.
„ 2nd Class ...	Major.
„ 3rd Class ...	Captain.
Staff Assistants.	
Assistant of Corps d'Armée ...	Colonel.
„ of Division ...	Lieut.-Colonel.
„ of Brigade ...	Major.

The Staffs of the new formations are not yet complete.

In the future the officers of the Staff are to come from the Superior Staff School. Until the new system of military schools has furnished its first promotion of officers, and the best subjects of the said promotion have completed two years of regimental service and two in the War School, which cannot be until towards 1914, the best pupils of the Officers' Schools of Pao-ting-fou, Wu-chang, and Nankin, as well as those who have been through the course of the Japanese Military Schools, will be admitted to the school.

The Superior Staff School will only be opened on the return of the special mission sent abroad to study the question; it will have for its head, Fong-Kono-Tchang, Director-General of the Pao-Ting-Fou Schools, recently appointed Chief of the Department of Instruction to the *Lien-ping-tchou*. This military Mandarin would be inclined to employ chiefly Japanese professors, but without doubt other influences will intervene, so that the body of foreign instructors shall comprise officers of all nationalities. The length of the course is fixed at two years.

The Staff Assistants will be chosen either from among regimental officers, officers of the *Intendance*, or the General Staff of the Army. One may predict that many years will pass before China succeeds in constituting a real corps of Staff officers, imbued with the scientific spirit and method, and having acquired the power of work, devotion, and patriotism which make the true superiority of foreign Staffs.

Service of Administration.—The principle which has been followed in the organisation of this service has been to relieve the commanding authority of all administrative care, and also of removing the temptation of levying tolls on the pay of soldiers. The actual administrators, for the most part prospective civil Mandarins, and little conversant with accounts, possess but small technical competence. The Military School of Administration "for rapid instruction" will perhaps improve the lower ranks, but it will exercise little influence on the administration of the service. The regulations for the general organisation are sparing in what concerns the Administration service:—

"Foreign countries do not give high pay to their soldiers, but the State furnishes clothing and food; officers and soldiers have thus no care on this head, and can devote themselves entirely to the preparation for war.

"The Tartar Marshals, Viceroys, and Governors are to propose a system approaching as nearly as possible to that of foreign countries, taking into consideration the particular conditions of each province (dearness of provisions, stores, etc.).

"In each province the Treasurer is to pay the exact wages on the fixed date; the soldiers will sign the pay lists.

"Every attempt at squeezing or late payment will be severely punished.

"The soldier's clothing is not to inconvenience his movements, and glaring colours are to be avoided.

The clothing will be provided by the State.

"The insignia of rank will be worn on the epaulets.

"The head-dress will be provided with a peak.

Hierarchy.

Officers of <i>Administration</i> (properly so-called).		<i>Relative Rank.</i>
Quartermaster-General (1 per Army Corps) ...	...	Colonel.
Assistant Quartermaster-General (1 per Division) ...	...	Lieut.-Colonel.
Quartermaster (1 per Regiment) ...	...	Major.
Assistant to the Administration (1 per Camp) ...	...	Captain.
<i>Administrative Officers.</i>		<i>Relative Rank.</i>
Officer of Administration (1st Class) ...	...	Lieut.-Colonel.
" " (2nd Class) ...	...	Major.
" " (3rd Class) ...	...	Captain.
" " Assistant ...	...	Lieutenant.
Cadets ...	...	Sub-Lieutenants.

There are in addition:—

Some Supply Officers.

And Secretaries, ranking with Sub-Lieutenants.

Some special regulations touching the Administration service have been published, and may be summarized as follows:—

"Those in command are relieved of all care of regimental administration, and are to devote themselves entirely to instruction and preparation for war.

"The carrying out of the Administration service is centralised in the provincial *Tou-lien-tchou* by the Quartermaster-General, who receives his general instructions from the Bureau of the administrative departments of the *Lien-ping-tchou*. This official draws the pay from the provincial Treasury and sends it, under escort, to the divisions, schools, and departments. He has under his immediate control the clothing, encampment equipment, depôts, etc., and is responsible for sending the necessary stores to the divisions.

"The divisional Assistant-Quartermaster-General transmits the pay and stores to the brigades, regiments, and non-brigaded units, and exercises administrative surveillance over all the units of the division.

"The regimental Quartermaster directs the general administration of the corps, and controls the battalion Administration; he transmits to them the pay and stores, looks after the carrying out of the distribution and verifies the accounts.

"The detachment Quartermaster transmits the pay and stores to the units, and controls the accounts of the company administration-cadets."

The pay of the officers and men, the money destined for the purchase of forage and rice for the men are sent to the corps every month on a fixed date, the officials who have to distribute them checking the weights and giving receipts.

The pay of the men in the Administration department is fixed at 4.5 taëls a month. The Bureau of the provincial *Intendance* retains:—

1. One taël (3 fr. 50) for the soldier's family.
2. One taël as the cost of the monthly rice ration.

The men thus receive two taëls and a half, out of which he has to purchase certain other necessities.

The funds destined to the purchase of forage were at first sent to the camp commandants; but as the animals visibly suffered under this method, it was decided that the camp Quartermasters should themselves make the purchases and be responsible for their proper distribution.

The stores of clothing, equipment, and camp equipage, with tools and *matériel* of all kinds, are sent and received in the same manner as pay.

The rates of pay have been fixed as follows in Chi-Li:—

General of Division	...	...	400 Taels	+	600 for service expenses.
General of Brigade	...	...	250	"	+ 250 " "
Colonel	...	...	200	"	+ 200 " "
Lieut.-Colonel	...	...	100	"	+ 140 " "
Major	...	...	100	"	+ 150 " "
Captain	...	...	50	"	+ 10 " "
Lieutenant	...	...	40		
Sub-Lieutenant	...	...	25		
Sergeant	...	...	5.8		
Corporal	...	...	4.8		
Soldier, 1st Class	...	...	4.5		
" 2nd Class	...	...	4.2		
VOL. LI.			2 q		

The officers receive no allowance for lodging, clothing, or equipment.

The forage allowance for a horse has been fixed at 4.8 taëls, which is amply sufficient.

The actual pay of the soldier is considered as a just *minimum* by the Viceroy Yuan, at least in Chi-Li, where living is dearer than in the centre and south of China.

The soldier can only add to the 600 gr. (1.33 lbs.) of rice which composes his daily food out of the balance of his 2.5 taëls remaining after deducting for the purchase of other necessities, and that is not much.

It is often said that the Chinaman can content himself with very little. Although his sobriety is a well-recognised fact, it is not less true that the amount of work he can do depends upon his nourishment. To give him the necessary stamina for his active life it is necessary that he should add to his rice, millet or rye cakes, beans, meat, tea, and sometimes alcohol. The soldier of to-day is a very different person from the one of yesterday, who, after an hour's drill spent the rest of the day lying down on his mat. He of to-day is a robust, well-developed man, who has to put in 7 or 8 hours of hard work daily, and consequently requires plenty of good nourishment. If this nourishment is limited to 600 gr. (1.33 lbs.) of rice, the stamina of the man will soon be sapped and debility, with all its consequences, set in. This question of the soldier's food is occupying the attention of the high military authorities, who are directing the reorganisation of the Chinese Army. It is recognised that the soldier must have three meals of rice instead of two, and must have a ration of meat, suet, and vegetables, and it is also recognised that the simple procedure of handing him over money, even if a sufficient sum was supplied, to enable him to purchase the extra food, can no longer be maintained, and that the Administration must from henceforth consider the advisability of having recourse to a system of messes, such as are common in foreign Armies.

Yuan-Chi-Kai has already taken a first step in this direction. He has installed in the Matchang Division some improved mills for grinding the grain purchased by the soldiers and the rice ration distributed by the Administration. He has made war biscuits, with which experiments are to be made during the manoeuvres.

The Viceroy of Chi-Li also proposes to improve the feeding of the animals. He has had ground purchased where sorgh and other forms of grass suitable for forage will be sown, and pasture land where the animals will be turned out to graze; but all this has necessitated a considerable first outlay.

The various questions of clothing, equipment, and the establishment of camps are also occupying the attention of the *Lien-ping-tchou*.

An attempt is also being made to become independent of the foreign houses and to create in China a military industry. Shanghai and Tientsin already make kits, knapsacks, hats, boots, etc., while there is a large harness manufactory at Taku. The Viceroy Yuan has also studied the question of military workshops and the utilisation of the manual labour of the prisons.

The uniform of the new Army (officers and men) is to be radically modified and assimilated to the Japanese model.

It will be some years yet before the Administration Department of the Chinese Army will emerge from the embryo stage and possess a skilled and complete *personnel*. The Viceroy Yuan is creating at Paoting-fou a special school of Administration, where there are already some forty cadets. For the moment the officers of administration and secretaries are recruited from among the best of the non-commissioned officers, who have received special instruction.

The Medical Service.—The few military doctors, who have had a modern education, at present serving with the new Army, only possessing a fair theoretical knowledge, have not yet acquired a sufficient practical experience to treat serious cases of illness in time of peace and attend badly wounded in time of war. They can carry out prophylactic measures, can make properly an antiseptic dressing, treat for a gastric obstruction, or reduce a simple fracture; but they could not make an amputation with any chance of the patient recovering, or diagnose and treat with success cases that are at all complicated. Moreover, the Chinese soldier has no great faith in the new military doctors.

It must be remembered, however, that the regimental infirmaries are well ordered, and the quarters in barracks cleaner than formerly. The new Chinese School of Medicine, created in 1905 at Paoting-fou, and those which are to be established in other provinces, the missions of study sent to Europe, Japan, and the United States will certainly produce better practitioners, but they cannot yet be compared with Japanese doctors, for example, whose preparatory scientific instruction is begun earlier. There are no military dispensers, but they are soon to be provided.

With regard to military veterinary surgeons, the mediocrity of their results proves that their science is very rudimentary. A Veterinary School, recently formed at Paoting-fou, is to give a rapid course of instruction to some young men who have received no special preparation.

In time of war the present Medical Department, even with the assistance of the mobilised civil *personnel*, will be very embarrassed to ensure the working of the ambulances and field hospitals on the field of battle; the lightly wounded could be cared for, but it is probable that the doctors, insufficiently assisted by the mediocre hospital attendants sent them at the moment of mobilisation, will be quickly overwhelmed by the influx of the badly wounded.

With regard to the train charged with the duty of horsing the medical units and of moving the sick and wounded to the rear it will show itself, for want of preparation and means, unequal to its duty, as will that of the Administration for carrying out the movements of convoys.

Nevertheless, such as it is at present, it marks an incontestable progress over the old state of things, which allowed only for the use of some stretchers.

Organisation.—The general organisation regulations thus lay down the duties of the medical service:—

1. *In Time of Peace.*—Inspection of the drills from the physiological point of view, and of the quarters in barracks, technical boards for

clothing, food and hygiene, prophylaxis, medical attention to the soldiers.

2. *On the March.*—Inspection of the soldiers during the route, dépôts for men temporarily disabled and for men to be sent to hospital, prophylactic measures in camps and cantonments, inspection of provisions, etc.

3. *On the Field of Battle.*—Picking up the wounded, establishment of dressing stations, of ambulances and field hospitals, removal of men to the hospital.

A special edict has approved the statutes of the Red Cross Society.

On the subject of the veterinary service, the regulation confines itself to saying: "It is necessary to have hospital attendants for horses."

The order bringing the regulations into force have not yet appeared officially. The Chinese journals have, however, some circulars on the hygienic maintenance of camps, on prophylactic measures in case of epidemics, and given the outlines of a scheme for the organisation of ambulances and field hospitals.

The circulars in question contain nothing of very special interest; they simply show that the military administration is giving its attention to enforcing elementary hygienic rules from this time on, which up to the present have been totally neglected in the Chinese agglomeration.

(To be continued.)

THE BATTLE OFF TSU-SHIMA.

IN MEMORY OF "THE SUVÓROFF."

A PERPETUAL TRIBUTE TO FALLEN HEROES.

Translated from the Russian of Commander Vladimir Semenov,
Imperial Russian Navy,

[With the Author's permission],

By Lieut.-Colonel W. E. GOWAN, Retired List, Indian Army.

Continued from April JOURNAL, p. 470.

Suddenly I hurried off towards the conning-tower, to the Admiral. Why? I had not then committed myself to any definite opinion as to the state of affairs, but now it seems to me that I must have made this hurried move simply because I must have wished to look at him, and in his look to verify my own impressions: "Does not so-and-so only seem to me to be?—is it not a mere phantom of my imagination? Have I not simply turned coward?"

As I was running up on to the fore bridge, I nearly fell, through slipping in a pool of blood—for here Chief Signaller Kandauroff had just been killed. I then entered the conning-tower.

The Admiral and the Captain, both in a bent position, were looking through the apertures between the armour plates and their covering.

"Your Excellency," said the Captain, gesticulating with animation, as he always did, "we must alter the distance! They have already been well hammered—let us give them a good drubbing!"

"Wait a bit. We, too, you must know, are being hammered," replied the Admiral. For on either side of the wheel lay two men face downwards, both of whom were dressed in tunics of officer's pattern.

Midshipman Shishkin, whom I touched on the arm as I pointed to the bodies, shouted in my ear: "The Chief Helmsman and Berseneff!¹ Berseneff fell first, shot through the head!"

The range-finder was being worked, and Vladimírski was giving out his orders with a sharp voice, whilst the electricians were briskly turning the small arms of the pointers, thus conveying to the turrets and to the casemates the various distances to the enemy's vessels.

"It is nothing after all!" thought I, as I passed out of the conning-tower; but immediately the idea came to me: "Supposing they do not see what is taking place on the battle-ship!"

¹ Berseneff was Flag Artilleryist and Colonel of Marine Artillery.
—Author.

After leaving the conning-tower, I began to anxiously gaze from the fore bridge, and I could not put away from me my recent fancies, although I had not dared to trust myself to give audible expression to them. No!

The enemy had, by this time, completed his circling movement; his twelve vessels were in orderly formation, at close intervals, and they were steaming on a course parallel with our own, but they were gradually forging ahead. No confusion was noticeable amongst them. As I looked through my Zeiss glasses—their distance from us now was a little more than 20 cables' length¹—I could almost distinguish the hammock defences on the bridges and groups of men. And with us? I looked about me—what destruction! Burning wreckage on the bridges, blazing fragments on the deck, heaps of corpses. Signalling and range-finding stations, posts for the observation of falling projectiles, all swept away, all destroyed. Astern of us the "Alexander" and "Borodino" were likewise enveloped in the smoke of the fire that was raging on board each of them.

No! It was altogether quite unlike the battle of the 28th July (9th August)!

The enemy, after heading us, began to rapidly incline to starboard, endeavouring to cut across our course, but we also turned to starboard, and thus once more brought him almost on our beam.²

Time, about 2.5 p.m.—Someone now ran up to report what had happened in the stern 12-inch turret. I therefore went to see what it was. A part of the roof over the port gun had been smashed in and torn away in an upward direction, but the turret continued to revolve, and an energetic fire from it was going on.

The Senior Officer, in charge of the fire-engine parties, had had a leg shot off, and they were carrying him away. Indeed, the men who were still unhurt, were becoming fewer and fewer. In all directions, even from the turret, into which splinters could only find their way through the narrow port holes, demands were being made for reinforcements to take the place of fallen or wounded men. The slain, of course, had to be left where they fell, but even for the removal of the wounded hands no longer sufficed.

On war-ships every man in a battle has his appointed post and his own duty; there are none to spare, and such a body as reserve men does not exist. The only resource, and this we adopted, was to take the crews of the 47 mm. guns and machine guns.

These men, so as not to expose them needlessly to fire, had been from the beginning of the battle collected below the armour-plated deck. Now, of course, they were perfectly free to undertake other duties, since all their guns, which were mounted in the open on the tops, had been destroyed altogether. Of these men, therefore, we now made use. But even so they were as a drop in the ocean. As regards putting out conflagrations, even if we had had the men there were now no means to combat with the flames. The rent hoses had several times been replaced by spare ones, which were speedily fitted to the hand engines. At last the stock of spare hoses became

¹ About 2½ miles.—W.E.G.

² "On the beam" is the direction which is at right angles to the keel of a vessel, or, in other words, to its course.—*Author.*

exhausted. And without hoses how could we pump water on to the bridges and on to the spars,¹ where the flames raged? Especially the spars,¹ where there was piled up a pyramid of eleven wooden pinnaces. At first this timber store caught fire only in places, so long as the pinnaces held the water, which had been poured into them before the battle. But the water soon began to flow out through the numerous rents caused by splinters, and finally drained off.

Of course, we did what we could to plug up these rents, and we passed along more water in buckets for this purpose.²

I do not know whether the scupper holes had been designedly closed, or whether they had simply become choked, in any case the water flowed out badly from the vessel's sides, and on the upper deck it was like a miniature dam. This circumstance was of the greatest service, as, in the first place, it prevented the deck itself becoming over-heated through the fire on board, and, secondly, with the water so collected, we quenched the burning fragments showered down from above, by simply dragging them along and plunging them into it.

Close to the starboard bow 6-inch turret, and near the ladder leading up to the fore bridge, I saw Flag Midshipman Demchinski with a party of fore-castle signallers, and I went towards him. Midshipman Golovnin (turret commander) gave us some cold tea, a store of which he had with him in bottles.

It may seem nonsense on my part to say so, but I began to be more cheerful.

Demchinski then told us that the first shell, which had struck the battle-ship, had fallen into the temporary dressing station, which the ship's Surgeon had established, where, as it had appeared to him, was the most spacious spot. This was in the upper battery, close to where the ship's Sacred Picture was hung up, between the central 6-inch turrets.

Many men had been killed by this shell; but the Surgeon himself had somehow escaped unhurt. The vessel's Chaplain, however, Priest Father Nazarius, had been mortally wounded.

I at once had a desire to go and see the place.

The vessel's Sacred Picture, or, more correctly, the various representations of Saints, of which there were many—all benedictory offerings made in order that the battle-ship might have a prosperous commission—had remained perfectly whole. Even the glass of a large *Ikón*³ case had not been broken. And in front of it, in a hanging stand, were still peacefully burning several candles. But round it there was now not a soul. Only amidst smashed up tables, stools, broken bottles, and scattered bandaging materials lay several corpses, and even heaps of that which one could, with difficulty, only guess to be the remains of human bodies.

¹ Probably some kind of timber baulks forming a frame work to which the pinnaces were lashed.—W.E.G.

² The Commander-in-Chief of the Squadron had ordered that all the iron drums, which had contained machine oil, and which had not been thrown overboard during the long voyage, should be converted by the ship's carpenters into buckets, and these improvised receptacles for water were placed in large numbers along all the decks.—*Author*.

³ A holy picture of some sort.—W.E.G.

I had not succeeded in taking my eyes off this scene of destruction when Demchinski came down the ladder supporting Flag Lieutenant Sverbaiyeff, who could, with difficulty, stagger along. He was breathing heavily, and begged for something to drink. I ladled into a camp kettle, lying near, some water out of a bucket, and handed it to him. But finding that he had almost lost the use of his hands as well as his feet, Demchinski and I assisted him to drink. He took a long draught, uttered these broken phrases: "It's a trifle . . . tell the Flag Captain . . . I will come at once . . . I am choked by these cursed gases. . . . I only want to recover my breath." His livid lips laboriously drew in the air; in his throat and chest there was a gurgling sound, but of course his difficulty in breathing was not the result of poisonous gases. His tunic had been torn away altogether from the right of his spine, and from this wound there was a copious flow of blood. Demchinski then placed him in charge of two orderlies, who carried him off to the dressing station, and we once more went to the upper deck.

I now crossed over to the port bow, passing between the 12-inch and 6-inch fore turrets, to have a look at the Japanese fleet.

Their vessels were exactly as they were before! Not a fire on board, not a list, no broken down bridges. In a word, they did not seem to be engaged in a battle, but in target practice. It really seemed as though our guns, which had been unceasingly thundering for already half-an-hour, had not been discharging projectiles, but the devil knows what!¹

With a feeling akin to despair, I closed my binoculars, turned round and went aft.

"The last haliards have been burnt," was the communication that Demchinski made to me, as we once more met. "I think that we ought to bring our men somewhere under cover."

I of course fully agreed with him; for why should signallers be exposed to fire, when no means, wherewith they can signal, have been left to them?

Time, about 2.20 p.m.—As I was making my way through the wreckage at the stern, I ran up against Raidkin, who was hurrying off towards the forecastle.

¹In the battle off Tsu-shima, the Japanese loss was as follows:—Killed, 113; mortally wounded, 139; severely wounded, 243; slightly wounded, 42 (!). Apart from the statements of Japanese officers, who might be partial, these figures speak with sufficient eloquence. Almost half of their total loss (252 out of 537) was tabulated under "killed" or "mortally wounded." The other half comprised the "severely" and "slightly wounded," or less than 8 per cent. Their total loss was infinitesimal, and, therefore, it is evident that our shells either did not burst at all, or burst badly, i.e., they broke up into a small number of large pieces, instead of into a large number of small pieces. The bursting charge of the Japanese shells was seven times greater than that of our own, and it consisted not of pyroxilin but of *Shimosa* powder (or it may be of something even more powerful than that). *Shimosa* powder, on exploding, develops a temperature one and two-thirds higher than that of pyroxilin. In the womb of the future it may be found that one successfully bursting Japanese shell inflicted as great destruction as did twelve of ours, which also successfully burst. But we know that ours did not burst at all.—Author.

"Ah! in the nick of time!" he excitedly exclaimed; "they can no longer fire out of the port stern turret, as beneath it, and all around it the fire is blazing. The men are choking from the heat and smoke."

"Well, then, let us collect some men from somewhere and go and try to put it out."

Demchinski's answer was: "I will do so, but go you, and report the matter to the Admiral. Perhaps he will direct something to be done."

"But what can the Admiral order to be done?" I said.

"Perhaps he will alter the course—I don't know."

"Does that mean he will withdraw from the battle formation? That he will hardly do!"

"No; but meanwhile you are delaying!"

In order to quiet him, I promised that I would at once make the report, and we then parted, and, as it turned out, to meet no more.

As I anticipated, on hearing my report, the Admiral merely shrugged his shoulders, saying: "Let them put out the fire. From here I can give no assistance."

In the conning-tower there now lay not two, but five or six dead men: and, for want of helmsmen, Vladimirski himself was at the wheel. Drops of blood were trickling down his face, but with moustaches smartly twisted upwards, he still preserved his wonted brave bearing, and his aspect was that of the same self-confident man that his mess-mates of the ward-room knew him to be when they listened to his disquisitions on "the Future of the Artillery."

On leaving the conning-tower I had the intention of going off again to Raidkin, in order to convey to him the Admiral's answer, *à propos* of giving assistance in the putting out of the fire, but I lingered still on the bridge looking at the Japanese vessels.

IV.

After a quarter-of-an-hour's steaming on their new course, the Japanese had again rapidly forged ahead of us, and now the "Mikasa," which was leading, was gradually inclining to starboard with the object of cutting across our bows. I expected that we, too, would at once begin to turn in the same direction, but the Admiral for some time longer held on to our old course. I surmised that, in so doing, he desired to reduce as much as possible the distance between the contending fleets. And certainly, for us that would have been an advantage, since with our broken range-finders and our shattered posts of observation, our guns were only fit for firing almost at point blank range. Nevertheless, to allow the enemy to cut across our course, and to subject ourselves to a longitudinal fire, was also out of the question. Whilst I was anxiously counting the moments, I look and waited, and the thought flashed through my mind: "Will there be time! or not? No, there will not be time!" The "Mikasa" was drawing nearer and nearer to our course. Indeed, from their starboard 6-inch turret they were preparing to fire at us. At that very moment we rapidly swung round to starboard. I once more breathed freely and took a look round.

Demchinski and his men had not yet left their turret, but were busy doing something. It appeared to me that he was taking into the turret the boxes of 47 mm. gun ammunition which had been stacked on the deck outside, lest they should begin to explode from the heat of the fire that was raging, and should kill his men. I was going down to him to inquire what he was doing, but I had not time to say a word before the Captain appeared on the top of the ladder behind me. His head was covered with blood. And as he staggered along he was convulsively clutching the handrail. At that moment a shell burst quite close to him, and from the shock of the explosion he lost his balance and was falling headlong from the ladder, when fortunately we saw it in time, and succeeded in catching him before he fell on to the deck.

"It's nothing! Only a trifle! My head swam!" he assured us in his usual quick way of speaking, and with an almost cheery manner, rose to his feet and tried to push past us.

But as there were three more ladders further on for him to descend before he could reach the dressing station, we laid him, in spite of his protests, on a stretcher.

"The stern turret has been blown up!"¹ came a shout from some part of the vessel.

Almost simultaneously there resounded overhead a peculiar rumbling noise, and then the shrill crackling of rent iron; then something huge and heavy seemed literally to groan; the pinnaces piled up on their frame work bulged and broke in pieces. From above poured down some kind of fused fragments, and then an impenetrable smoke enveloped us. At first we could not imagine what had happened, but soon became aware that the fore funnel had fallen down.

The dazed and stupefied signallers, in thick groups, bore us along with them, as they rushed to the side of the vessel and almost buried us beneath the wrecked woodwork. We could scarcely stop them by force in our endeavour to bring them to reason.

Time, about 2.30 p.m.—As soon as the smoke had somewhat cleared off, I wished to pass on to the poop-deck to see what had happened to the stern turret, but along the upper deck all communication between the bow and stern of the vessel was interrupted. I then endeavoured to go along by the upper batteries, whence, through the Admiral's cabin, there was a direct outlet to the poop-deck; but here the Staff Officers' quarters seemed to be in possession of a dense fire. Whilst returning, I met, as he was quickly descending a ladder, Flag-Lieutenant Krijanovski.

"Where are you off to?" I inquired. "To the steering compartment; the rudder has got jammed!" he ejaculated, as he hurried off.

"Would that this had not happened," thought I, as I rushed towards the fore bridge again.

Having reached this I could not, for a moment, make out our position; for not far to starboard our Squadron was steaming on an almost opposite course. Especially engraved on my memory is the "Navarin," which, after having had to fall astern, was again driving

¹ From the other vessels they saw the armour-plated roof of our stern turret hurled above the bridges, and from that height fall on to the poop deck. How it really happened is not known.—*Author.*

ahead and steaming at full speed, for I could see that she was throwing up a huge wave with her prow.

It was evident, too, that the "Suvóroff" had, because of her jammed rudder, made a turn of nearly 16 points¹ before the telegraph directing the turn had been heard.

The battle line, too, of our Squadron was very irregular, and markedly extended, especially that of the Third Battle-ship Division. I did not see the leading vessels, as they were to leeward of us, and were obscured from view by the smoke proceeding from the fire on board our vessel. The enemy was in the same direction. Calculating by the position of the sun, and by the prevailing wind, it might be said that our Squadron was now steaming approximately S.E., and that the enemy was heading away from it towards the north-east.

It had been previously arranged that in case the "Suvóroff" should have to fall out of the battle-line, the torpedo-boats "Baidóvii" and "Bwistrii" should at once steam up and take the Admiral and his Staff on board and convey them to one of the still undamaged vessels. And yet, however much I strained my eyes on all sides, I failed to discover any of our torpedo-boats. We had no means of signalling, since the whole of our signalling apparatus had long since been shot away.

Meanwhile, if we, because of the smoke of the fire proceeding from our vessel, could scarcely see the enemy, he could see us very well, and he would concentrate the whole strength of his fire, so as to bear on our battered battle-ship, and thus overcome her finally. Indeed, his projectiles were still being discharged at us one after the other. His fusillade was a very whirlwind of flame and iron. Almost motionless, or but slowly moving, in order to get upon her proper course in wake of the other vessels of the Squadron, the "Suvóroff" would have had to present in turn her battered sides to the enemy, whilst madly defending herself with her yet undamaged guns, already but few in number.

The following is the record of these moments, by eye-witnesses amongst our former enemies²:—

¹ 1800.—W.E.G.

² For the purpose of establishing a connection between the series of incidents which I personally witnessed, and about which I have written, and also for the purpose of explaining the operations of the Japanese, I will avail myself of sources of information, which, I suppose, cannot be suspected of partiality towards us: these are two Japanese brochures of official issue, and both are entitled, "Nippon-Kai Tai-Kai-Sen," i.e., "The Great Battle of the Sea of Japan." These brochures are illustrated by numerous phototypes, and by relief maps of the different phases of the battle, and they contain reports from the various Japanese vessels, which were written by those on board at the time. Certain immaterial differences in the description of details on the part of the several witnesses have in no way been smoothed over, since they only give to the publication thereof a peculiar character of veracity.

I beg my readers to excuse the halting, and sometimes even disconnected, language in which I have cited the quotations. The reason for this has been that I wished to adhere, as closely as possible, to the original text, but the Japanese language, in the construction of its phrases, is quite unlike any European tongue.—*Author.*

(To be continued.)

NAVAL NOTES.

Home.

The following are the principal appointments which have been made: Rear-Admirals—Sir Percy M. Scott, K.C.V.O., C.B., to command of First Cruiser Squadron; J. R. Jellicoe, C.V.O., C.B., to be Rear-Admiral in Atlantic Fleet. Captains—E. E. Bradford, C.V.O., to "Pembroke" as Commodore, 2nd Class, in command of Naval Barracks, Chatham; R. H. S. Bacon, D.S.O., to be Chief of the Staff to the Commander-in-Chief, Home Fleet; J. B. Eustace to "Cambridge"; J. M. De Robeck to "Carnarvon"; O. F. Gillett to "Diadem"; H. Jones to "Furious"; J. de M. Hutchison, C.M.G., to "Devonshire"; C. E. Kingsmill to "Ramillies," for the command of a Division of Special Service Vessels at Devonport; R. F. Phillimore, M.V.O., to "Juno"; G. H. Mundy to "Canopus"; M. Singer to "Andromeda." Commanders—T. C. Smyth to "Latona"; J. D. Dick to "Amethyst."

The first-class cruiser "Diadem" arrived at Plymouth on the 2nd ult. from China, bringing home with her also the relieved crews of the "Sphinx" and "Lapwing" from the East Indies. She paid off at Chatham on the 11th ult., recommissioning on the following day for service in the Home Fleet, to the Portsmouth Division of which she will be attached, after undergoing refit at Chatham.

The second-class cruiser "Hermione" completed on the 2nd ult. at Portsmouth for service on the Cape of Good Hope station, leaving on the 15th ult. for her destination.

Re-constitution of the Fleets.—The Channel, Atlantic, and Mediterranean Fleets have been re-constituted as follows:—

Channel Fleet.

Battleships — "King Edward VII." (flag-ship of Commander-in-Chief), "New Zealand," "Hindustan," "Commonwealth," "Hibernia" (flag-ship of Second-in-Command), "Britannia," "Africa," "Dominion," "Illustrious" (flag-ship of Rear-Admiral), "Jupiter," "Vengeance," "Ocean," "Swiftsure," "Triumph."

Attached cruisers—"Talbot," "Juno," "Topaze."

Atlantic Fleet.

Battle-ships—"Exmouth" (flag-ship of Commander-in-Chief), "Cornwallis," "Duncan," "Russell," "Albemarle" (flag-ship of Second-in-Command), "Albion."

Attached cruisers—"Arrogant," "Amethyst," "Diamond."

Mediterranean Fleet.

Battle-ships—"Queen (flag-ship of Commander-in-Chief), "Prince of Wales," "Venerable" (flag-ship of Second-in-Command), "Formidable," "Implacable," "Irresistible."
Attached cruisers—"Diana," "Minerva," Venus," "Barham."

Home.

Cruiser Squadrons.

First—"Good Hope" (flag-ship), "Argyll," "Hampshire," "Roxburgh."
Second—"Drake" (flag-ship), "Black Prince," "Antrim," "Devonshire."
Third—"Bacchante" (flag-ship), "Aboukir," "Lancaster," "Suffolk."

The First Cruiser Squadron, consisting of the first-class armoured cruisers "Good Hope" (flag-ship of Rear-Admiral G. Nevile, in command), "Argyll," "Hampshire," and "Roxburgh," left Plymouth on the 3rd ult. for a cruise to the West Indies and the United States. The squadron arrived at Hampton Roads on the 25th ult., where it has been taking part in the Celebration in honour of the Tercentenary of the establishment of the first permanent English settlement in the New World at Jamestown. A fleet of sixty-seven vessels has been assembled to do honour to the occasion, twenty-seven of which were foreign ships, and the remainder vessels of the U.S. fleet. The Tercentenary commemoration ceremonies opened on the morning of the 26th ult., which was the 300th anniversary of the date on which the little fleet, consisting of the "Susan Constant," "Discovery," and "God-speed," under the command of Captain Newport, anchored off Cape Henry, then named after the Prince of Wales.

Launches.—The new first-class armoured cruiser "Invincible" was launched on the 13th ult. from the Elswick Yard, Newcastle-on-Tyne. She is a sister-ship to the "Indomitable," launched on the 16th March from the Fairfield Yard, at Govan, details of which were given in the Naval Notes for last month.

The first-class armoured cruiser "Defence" was launched on the 27th ult. at Pembroke Dockyard. She is one of the "Minotaur" class, the third vessel of the same type being the "Shannon," now completing at Chatham. Her principal dimensions are as follows:—Length, 490 feet; beam, 74 feet 6 inches; displacement, 14,600 tons, on a mean draught of 26 feet 6 inches. Protection is afforded by a 6-inch Krupp steel belt, tapering to 4 inches at the extremities, and a citadel above the belt protected by 3-inch armour. The gun positions for the heavy guns are protected by 8-inch and for the secondary battery by 7-inch armour. The armament consists of four 9.2-inch guns, ten 7.5-inch Q.F. guns, two 12-pounder and thirty 3-pounder guns, with five torpedo discharges. Her engines are to develop 27,000 I.H.P., giving a speed of 23 knots.

The new ocean-going destroyer "Ghurka" was launched on the 29th ult. from Messrs Hawthorn, Leslie & Co.'s Yard at Hebburn-on-Tyne. The "Ghurka" will be propelled by turbine machinery of Parson's type. There will be three shafts with one propeller to each, and special turbine arrangements are made to enable the vessel to steam economically at cruising speeds, and also to facilitate efficient manœuvring astern. The boilers are of modified Yarrow type, and the furnaces are arranged to burn oil fuel. She has three 12-pounder Q.F. guns and two 18-inch torpedo-tubes.

Home. *Report of the Naval Manœuvres of 1906.—Admiralty Remarks.*—The manœuvres were deprived of much of their value owing to the small proportion of merchant vessels which accepted the Admiralty terms for taking part.

The percentage of loss of merchant vessels was high (55 per cent.), and would appear alarming were it not for the fact that this success of "Blue" was only achieved at the expense of the complete disorganisation of his fighting forces, and that, as stated by Chief Umpire, had hostilities continued "it is practically certain that the commencement of the third week of the war would have seen all commerce-destroying ships either captured or blockaded in their defended ports."

It is probable also that the percentage of loss would have been very considerably lower had it been possible for all the merchant-ships traversing the manœuvre area, to the number of upwards of 400, to take a part in the proceedings; as it was, the attack of the 27 battle-ships and cruisers and 30 destroyers of the "Blue" Fleet was concentrated upon the inadequate number of 60 merchant steamers and 34 gun-boats and destroyers representing merchant steamers; in consequence, the actual percentage of loss is misleading, and affords little or no basis for calculation of the risks of shipping in time of war. It should also be noted that considerations of expense and the fact that the attacking fleet was on the seaward flank of the trade routes prevented wide detours being made for the purpose of avoiding capture.

The summary of "Red" and "Blue" losses given below will show the cost of a *guerre de course* against a superior naval Power, and proves that although a temporary commercial crisis might possibly be caused in London by this form of attack, the complete defeat of the aggressor could not be long delayed, with the result that public confidence would be quickly re-established and the security of British trade assured.

To make an enemy's trade the main object of attack while endeavouring to elude his fighting ships is generally recognised as being strategically incorrect from the purely naval point of view, and this procedure could only be justified if there were reason to suppose the hostile Government could by such action be coerced into a mis-direction of their strategy or premature negotiations for conclusion of hostilities.

As it was considered desirable, however, that the risks to British shipping should be examined under the most unfavourable conditions conceivable, the "Blue" Commander-in-Chief was directed to carry out a plan of campaign which is generally allowed to be strategically unsound, and there is no doubt that, fettered as he was by these limitations, he achieved his mission with great ability, though it is open to question whether he might not have achieved a greater measure of success by the employment of his cruisers only for the *guerre de course* and the concentration of his battle-ships for attacks upon the line of the "Red" Admiral's communications.

Remarks by Chief Umpire.—The general result is that out of 94 sailings, there were between noon on the 24th June and noon on the 2nd July, 52 captures, or 55.2 per cent. of the total trade represented in the operations. These figures at first sight appear alarming, and destruction of trade at this rate would undoubtedly cause a commercial crisis in the country.

In any statistical analysis of the value of this percentage of damage there are, however, certain arguments which must be considered.

Home.

The system of sending merchant steamers in groups along certain definitely arranged routes could not be fairly treated. This was owing to the fact that the number of vessels available for representing the trade of the country did not bear a fair proportion to the number of hostile vessels attacking that trade, and groups of sufficient numbers of ships could not be despatched.

For instance, a group of four steamers may be attacked by one cruiser, and all four may possibly be captured or destroyed, causing a loss to the country of 100 per cent. on that particular occasion.

But if, on the other hand, it had been possible to mass a group of 12 steamers sailing in company, and they had scattered on being attacked, the chances are against more than the same number, viz., four, being captured by the single cruiser. This at once reduces the percentage to 33·3 per cent.

The system of sending the trade along definitely arranged routes was also hardly given a fair test, as in practice the routes did not differ to any great extent from the ordinary steamer tracks.

Considerations of time, and therefore expense, naturally precluded in peace time the adoption of the exact methods which would be resorted to in war time.

In considering the actual facts of the manœuvres, it must be borne in mind that the attack on trade routes was considerably broken up and disorganised by the 30th June, and that the "Blue" ships remaining were acting independently, and though in singularly good positions for interfering with commerce, were (with the exception of the "King Edward VII." Squadron) without a leader.

The main idea which governed the conduct of the operations against the "Blue" commerce-destroying ships, viz., that the object was to bring the enemy to action rather than to attempt to actually protect the trade, is one which should appeal to the naval and mercantile mind.

Both the system of protected merchant convoys and that of a succession of rallying points along the trade routes at which men-of-war are to be found, would lead in practice to the frittering away of the forces at the disposal of the country.

It is true that during the late manœuvres the enemy's ships that remained after the southern attack on trade had been broken up, shifted their ground to the northward and placed themselves in the heart of the trade routes, at the entrance to the English and St. George's Channels.

Still, they could not long have maintained the offensive in the latter position, and it is practically certain that the commencement of the third week of the war would have seen all commerce-destroying ships either captured or blockaded in their defended ports.

It is therefore probable that on the outbreak of war, shipowners would prefer to be left with a free hand as to the action of their vessels as regards routes, times of sailing, etc.; but it is absolutely necessary that a limited control should be exercised by the Admiralty over the floating trade.

One of the most important considerations in connection with this subject would appear to be the question of affording all possible information to shipowners as to the safety or otherwise in war time of different routes and localities.

Home

Synopsis of Movements of Merchant Shipping.

Port.	Sailed.	Captured.	Re-captured.	Captured again.
Falmouth ...	2 Gunboats ...	1	—	—
	10 Destroyers ...	4	2	2
	18 Merchant Ships ...	7	—	—
Milford ...	22 Merchant Ships ...	18	—	—
Arosa Bay ...	2 Gunboats ...	1	1	—
	7 Destroyers ...	3	—	—
Gibraltar...	3 Gunboats ...	3	—	—
	10 Destroyers ...	9	3	2
	20 Merchant Ships ...	8	—	—
Totals ...	7 Gunboats ...	5	1	—
	27 Destroyers ...	16	5	4
	60 Merchant Ships ...	33	—	—
Grand Total ..	94 Ships ...	54	6	4

52 final captures = 55·32 per cent.

NOTE.—One merchant ship parted company from her group 15 hours before the remainder were captured. She proceeded to Lisbon for repairs and took no further part in manœuvres.

Summary of "Red" and "Blue" Losses.

Class of Ship.	Red.				Blue.			
	No. at commencement of hostilities.	Losses.	Re-main-ing.	Per Cent. Lost.	No. at commencement of hostilities.	Losses.	Re-main-ing.	Per Cent. Lost.
Battleships ...	20	9	19·1	4·5	9	2	7	22·2
Armoured cruisers ...	19	4	15	21·0	7	4		57·1
Other cruisers ...	24	8	16	33·3	10	4	6	40·0
Scouts ...	8	Nil	8	Nil	Nil	—	—	—
Torpedo gunboats ...	Nil	—	—	—	5	5	Nil	100
Destroyers ...	41	13	28	31·7	31	18	13	58·0
Torpedo boats ...	Nil	—	—	—	Nil	—	—	—

France.

The following are the principal appointments which have been made: Capitaines de Vaisseau—E. A. G. Serres to "Amiral Aube"; E. E. Nicol to "Jauréguiberry." Capitaines de Frégate—E. F. Carré to "Chasseloup-Laubat"; E. A. Conral-Bruat to "Léger" and 5th Mediterranean Torpedo Flotilla.—*Journal Officiel de la République Française.*

France.

The first-class battle-ship "Marceau" is to take the place of her sister-ship the "Magenta" as training-ship for seamen torpedo-men; her medium and light guns with their ammunition, with the exception of four 3-pounders, are to be removed, her heavy guns being kept in order but not ready for use. The ship will be struck off the list of those vessels ready for immediate mobilisation, but guns and stores will be kept in readiness for re-embarkation, should the necessity for mobilisation arise.

The new first-class battle-ship "Démocratie" is being prepared at Brest to commence her trials, and her sister-ship, the "Justice," is also about to commence her trials at Toulon.

The old coast-defence battle-ship "Tempête" at Toulon has been struck off the effective strength of the fleet, and is to be used as a target by the other ships of the fleet.

The new first-class armoured cruiser "Victor Hugo" has carried out another most successful three days' steam trial, during which time she maintained a mean speed of 19.5 knots. She commissioned for active service on the 5th ult. at Lorient, and proceeded to Hampton Roads, U.S.A., to take part in the Jamestown Tercentenary Commemoration; she will eventually proceed to join the Mediterranean Fleet.

An order of the Minister of Marine received at Brest directs that the battle-ships "Courbet," "Formidable," and "Devastation," are to be immediately placed in *réserve spéciale*; that is, to be ready for sea at 10 days' notice. Up to the present these vessels have been in *réserve normale*.

The Explosion on Board the "Iéna."—The Parliamentary Commissions (one of the Senate and one of the Chamber) have been investigating the causes of the explosion on board the "Iéna," visiting Toulon and examining witnesses. Their reports have not yet been issued, but the evidence seems to point to the explosion having been caused by the deflagration or spontaneous combustion of the smokeless powder known as B powder, used in the French Navy, due to the high temperature of the magazine.

Many more bodies in a mutilated condition have been discovered, and the ship does not yet appear to have been fully explored. Some reports say she is so badly injured structurally that it will be impossible to repair her for further service.

As regards the unstable nature of Powder B, if the following statement published by General de la Roque is correct, the authorities would appear to have been fully warned of the danger.

He says in the *Temps*: "From the first day this powder was adopted for the Navy I have not ceased to prophecy a catastrophe. In October and November, 1893, when this powder was introduced, largely through my efforts, I pointed out to the *conseil des travaux* that if black powder had certain dangers, the new powder had others not less terrible—that of spontaneous combustion; but, I added, it was easy to provide against this danger, by keeping the temperature of the magazines below 35° C. (95° F.). To do this I proposed to use the outside sea water as a refrigerator, circulating it through pipes in the magazine, but this was never done. Every three months the different ports had to furnish me the temperature of the magazines, which varied between 45° and 50° C. (114°—122° F.). After each of these reports I renewed my warning to the ministers and generals and all who would listen to me. In April, 1897, I said in my report to the Minister of Marine: 'The continuance of a higher temperature than 35° C. (95° F.) in the magazines of ships will certainly cause before long a lamentable disaster. This

France. is not a possibility nor a probability, but a certainty.' However, I was not listened to, and my reward for all this is that I have been placed on the retired list."

Admiral Bienaimé has also spoken in the Senate regarding B powder as follows: "Different stories are current as to the causes of the explosion on board the *"Iéna,"* but the truth is that the fault lies with this B powder, which decomposes spontaneously when the temperature rises above a certain degree, . . . and if I were Minister of Marine there would not have been a single grain of this powder remaining on board any of our ships the day after the catastrophe."

* *The Wreck of the "Jean Bart."*—The first-class armoured cruiser *"Condé"* from Virginie Bay, West Africa, where she had been assisting in the salvage of the stranded cruiser *"Jean Bart,"* arrived at Toulon on 7th April, bringing home the captain, officers, and crew of that vessel. The *"Condé"* left Toulon on 24th February with divers and all necessary salvage appliances. Many attempts were made to float the *"Jean Bart,"* but without success. It was then decided to save as much of the stores as possible, and more than 100,000 francs (£4,000) worth of material has been salvaged and placed on board of the transport *"Drôme,"* inclusive of four 164-mm. (6·4-inch), six 138-mm. (5·4-inch), and two 65-mm. (2·5-inch) guns, together with their mountings, all in good condition, and also two steam and two other boats.

M. Lockroy's Letters in the "Temps" on State of French Navy (continued).—It is a serious question: Which is the most economical, to build ships in the Government or in private yards. All maritime nations, inclusive of France, divide their orders, giving a certain number to the State arsenals and a certain number to private firms, which appears the most reasonable plan. Were the State to order all its new ships of private firms, it would have to submit to the exigencies and conditions which control such business; on the other hand, were it only to build in its own dockyards, it would deprive itself of the advantages to be derived from the initiative of private individuals, become the victim of routine, and the cost of construction would rise much higher, for a healthy rivalry tends to regulate prices and lessen the chances of a monopoly by private interests.

It is also an advantage to the State to see rising in prosperity by the side of its own arsenals the workshops of private firms, as in times of national danger it will be able to lay hands on vessels which have been ordered by foreign Powers—a thing which has quite recently been done by England, when she seized the *"Libertad"* and *"Constitucia,"* building for Chili, and incorporated them in her own fleet under the names of *"Swiftsure"* and *"Triumph."*

The principle of the advantage of the co-existence of both public and private arsenals being thus admitted, the question arises: In what proportion should they relatively be made use of? In England and Germany, where economics are most developed, the majority of the orders go to private firms; in France, the contrary prevails. In our last Budget we gave to private industry 70,000 tons of new construction, and to the State arsenals 90,000 tons. Was this right or wrong? There may be serious reasons for this unequal distribution; I do not allude to so-called political reasons or the belief that it is necessary to satisfy the partisans of the idea that the State should alone produce, or of the obligation there may be to give way to the demands of the representatives of the naval ports.

France.

I refer only to the official and avowable reason: That as we have five arsenals it is necessary they should be fully furnished with work, or we should be paying our workmen for nothing, resulting in a double loss. Why, however, should France keep up five arsenals in full work, each with the same staff, *personnel*, expenditure, and plant, at Rochefort, Lorient, Cherbourg, Brest, and Toulon, when two arsenals are enough for Germany, namely, Kiel and Wilhelmshaven, for Dantzig does not count?

To justify the upkeep of all these old arsenals of the sailing-ship days, all sorts of ingenious and misleading calculations are put forward, and, contrary to all appearance and reality, it is said that our dockyards can build cheaper than private firms, though in reality nothing is further from the fact. Such calculations are inspired by Parliamentary politics and homage to collectivist doctrines, and are only arrived at by the artifice of suppressing certain items in the accounts, thus inducing the public to believe that the State is an irreproachable employer, and that nowhere throughout the land is such a fervour and energy of work shown as in our arsenals.

If the French Naval Estimates are compared with those of any foreign country it will be seen that our new ships cost more to the State than those of other Powers. Take the "Dreadnought," for example. Here is a vessel of 19,000 tons and the most powerful battle-ship ever laid down. She has cost England 35 million francs, whereas the battle-ships of our new programme, with 1,000 tons less tonnage, cost us 45 million francs; and if the new German ships are taken for comparison, the result will be found the same. Therefore, Germany and England, without spending a sou more than we do can build four ships to our three. Can it still be said after this that we build cheaply?

As regards the actual cost given, the official figures of the naval authorities must be received with a certain amount of distrust. When we see our arsenals employed in foolishly manufacturing articles which could be bought much cheaper outside, and going in for milling work and the manufacture of flour, which it would have been cheaper to buy in the ordinary market, we have fair grounds for suspecting, despite official figures, that our battle-ships may also be no cheaper. With the arsenals, economy is not as necessary as it is for private firms, as the saying is: "The Princess pays for all," and the Princess in this case has plenty of money—about 300 millions.

The fact is that the State dockyards are not organised like those of private firms; the workman is in no way interested in the success of the enterprise; he is not accustomed to piece work, and the specialisation of work is not understood and little practised. How is it possible, therefore, to compete with private firms? The President of the Extra-Parliamentary Commission of 1894 asked the manager of the "Forges et Chantiers de la Méditerranée" how many workmen he would require to build three large battle-ships; the reply was, 1,500. On the morrow the same question was put to the Director of Construction of Toulon dockyard, and the answer was, 3,000! Can anyone make us believe that work done by 3,000 men costs less than the same work done by 1,500 men. But this is more or less a general statement; let us take a particular case—that of two of our latest battle-ships, the "République," built at Brest, and the "Patrie," built by contract. If we are to believe the figures of the Budget, the "Patrie" (deducting the cost of artillery and torpedoes) cost 34,187,922 francs (£1,367,517), and the "République" only 28,222,713 francs (£1,128,908), in round figures a difference of 6,000,000

France. francs (£240,000), or about 21 per cent.—a great reduction certainly in favour of Brest. But when we look at the matter closer our admiration is somewhat modified. The cost of the "République," we find, does not include the salaries of the naval constructors, though those officials were engaged during the whole period of construction, regulating the details and overseeing the work. Neither does it include a whole army of draughtsmen. How much they cost the State I should not like to say, but I know that the preparatory work for a large battle-ship, inclusive of the models and drawings, costs about 100,000 francs (£40,000). Then there is also the cost of superintendence, police, guards and watchmen, and the cost of administration. All these items are simply excluded in the case of the "République"; also it has been stated in Parliament that the general expenses of such an arsenal as Brest amount to 19 per cent. of the total expenditure, and if, as would be fair, this proportion be added to the cost of the "République," we must increase the actual cost by about 5,000,000 francs. This alone brings the figures up to 33,500,000, which is not far short of the cost of the "Patrie," without the other items I have mentioned. We must remember, too, that a private firm has to allow for interest on its capital, balance to be carried to reserve fund, as well as a reasonable profit, all matters which the State does not have to consider.

I do not, however, desire to argue from this that it would be wise to abolish our arsenals; all I say is that they require to be reorganised and specialised, and that two large building arsenals (one at Lorient for the largest vessels and one at Rochefort for smaller craft) would meet our requirements, provided they were not given other work. It is folly for us to maintain five building arsenals, all fully equipped; we should concentrate our forces, for concentration is the road to victory.—*Le Temps*, *Le Yacht*, and *Le Moniteur de la Flotte*.

Germany. The following are the principal promotions and appointments which have been made: Vice-Admirals—Borckenhagen to be Inspector of Naval Training and Education; Wodrig to be Director of Dockyards at the Ministry of Marine. Rear-Admirals—Borckenhagen, Breusing, Zeye, von Holtzendorff to be Vice-Admirals; Paschen to be Second-in-Command of the 2nd Squadron of the High Seas Fleet; Rollmann to be Second-in-Command of the 1st Squadron of the High Seas Fleet; Coerper to Command of Cruiser Division in China. Kapitän zur See—Paschen, Rollmann, Wallmann, to be Rear-Admirals; Wuthmann to "Mecklenburg"; Grapow to be Director of the Naval Academy.—*Marine ver ordnungs blatt*.

General.—With the launch of the "Schlesien" and "Schleswig-Holstein" there will be 24 battle-ships afloat, having each a displacement of from 10,000 to 13,200 tons. A new period in naval construction will now begin, in which the displacement will be increased to 18,000 tons, and the armament will be completely altered. This is expected to increase the cost of building each ship from 24,250,000 marks (£1,212,500) to 36,500,000 marks (£1,825,000). The 24 battle-ships just mentioned constitute the total output in battle-ships during the present Emperor's reign. Of the number, 18 have been built in private yards and only 6 in Government yards—a distribution of the work which has had the effect of increasing the number of workmen employed in private yards

from 20,400 men in 1890 to 41,300 at present. Simultaneously, the productive capacity of German shipbuilding yards has become greater, for whereas the construction of a ship of the "Brandenburg" class, with a displacement of 10,000 tons, took from three to four years in the early '90's, the "Deutschland," which has a displacement of 13,200 tons, has taken only three years to complete.

The German Admiralty is resolved that, in addition to the Kaiser Wilhelm Canal between the North Sea and the Baltic, other waterways shall be available for use by shallow-draught craft, and for this purpose the waters referred to are being tested by torpedo-boats, which are passing repeatedly through the Elbe and Trave Canal and the old Schleswig-Holstein Canal, which is a continuation of the North Sea and Baltic Canal between Rendsburg and Tönning at the mouth of the Eider.

Motor boats are being used more and more as tenders for waiting on the war-ships and torpedo-boats. They travel at the rate of 20 knots.

The German Admiralty has begun to build the projected Naval School at Mürwik, on the Flensburg Fiord. This school, which is to cost £100,000, is to be finished by the spring of 1908, when it will be occupied by the naval cadets of 1907, on their return from foreign waters. Next year the latest enrolled cadets and the cadet division will be transferred from Kiel and the Kiel forts to Mürwik.

The German Navy and Schulz-Thornycroft Boilers.—The Imperial German Navy has adopted the Schulz-Thornycroft boiler since 1896, at first on board of torpedo-boats, and then successively on board of small cruisers, large cruisers, and battle-ships. Since 1896 all the small cruisers of the Imperial German Navy except the "Gazelle" were from the beginning of their construction fitted with Schulz-Thornycroft boilers. The first large cruisers built for the German Navy were still fitted with boilers having water-tubes of wide diameter, but the experiments made with them seem to have been not very favourable, as the German Admiralty intends to provide narrow-tube Schulz-Thornycroft boilers for these large cruisers whenever the wide water-tube boilers need to be replaced. For the recently-built large cruisers the Imperial German Navy has adopted exclusively Schulz-Thornycroft boilers, and all the large cruisers being in course of construction will only be fitted with such boilers.

As to battle-ships, those completed up to date have got a boiler installation of cylindrical boilers combined with Schulz-Thornycroft boilers; on board the first built battle-ships the cylindrical boilers are prevailing, whilst on board the battle-ships recently finished, more than 75 per cent. are Schulz-Thornycroft boilers. For all the battle-ships now in course of construction, the German Admiralty has resolved on the exclusive adoption of the narrow-tube Schulz-Thornycroft boiler. This decision of the highest German naval authorities is a sufficient proof that the Schulz-Thornycroft boiler has stood its test in the Imperial German Navy. The duration of the Schulz-Thornycroft boiler is not shorter than that of other boiler systems. Schulz-Thornycroft boilers should in normal service last five years and more; after this time it will only be necessary to replace their tubes.

The annexed table illustrates the extensive use of the Schulz-Thornycroft boiler in the Imperial German Navy:—

Germany.

The Boiler Equipment of German War-ships.

Period covered by delivery.	Class of Vessel.	No.	Gross I.H.P. of Engines.	Gross I.H.P. of Schulz-Thornycroft Boilers.	Gross I.H.P. Cylindrical Boilers.
1898-1903	Battle-ships	18	253,500	183,220	70,280
1900-1907	Large Cruisers	3	65,600	57,600	8,000
1901-1907	Small Cruisers	17	167,600	167,600	—
1900	Gunboat	1	1,350	1,350	—
1898-1907	Torpedo Boats	19	90,850	90,850	—
1898-1905	Steam Launches	8	1,360	1,360	—
	Grand Totals	66	580,260	501,980	78,280

Transformation of the "Mine Company" into the "Mine Division."—

As the result of the lessons furnished by the Russo-Japanese War, the Mine Service in the Navy has been since 1904 completely reorganised. The first idea was to specialise in this service a body of men, and so a Mine Company was created. This company was formed of Volunteers from the Seamen Divisions, the Mechanic Divisions, the Artillery Divisions, and the Seamen-Torpedo Divisions. On the 31st March, 1905, one hundred men from the North Sea Command, and one hundred from the Baltic, were disembarked at Cuxhaven. On the 1st April the effective of the company (200 men) was complete. At the end of May a section was detached from the company, who were charged with the duty of clearing away submarine mines, six old "Schichau" torpedo-boats being placed at their disposal. In October, 1905, at the time of the incorporation of the recruits, the effective of the Mine Company was raised to a strength of 366 men, and at the beginning of this year the number of torpedo-boats placed at its disposal was increased by four.

After the incorporation of the recruits in the autumn, the effective was raised to 508 men, and ten torpedo-boats were placed at the disposal of the mine-clearing section for mooring mines, the torpedo-boat "S81" being told off as the chief of the flotilla. It is intended to attach to this flotilla, as soon as possible, as senior officer's boat, a large destroyer, fitted with wireless telegraphic apparatus.

The mines in question are blockade mines, and must not be confounded with ground mines, which, like the coast artillery, are worked by the men of the seamen artillery.

The different mine services are placed under the orders of the coast artillery and mine inspection, which comprises:—

1. The permanent Mine Commission, who have to consider all questions connected with ground contact and blockade mines.
2. The four sections of seamen artillery (the coast batteries, mine fields, search-light, booms) at Friederichsort, Wilhelmshaven, Lehe, and Cuxhaven.
3. The Mine Division (blockade mines), who will very shortly have at their disposal two specially fitted mine-laying vessels, and to which is attached the division for clearing away mines, with its ten boats. These mine-laying vessels, the "Nautilus" and "B," are of 2,500 tons displacement, with a speed of 20

knots. They will be manned by crews of 207 officers and men (of whom 3 will be Lieut.-Instructors), and be armed with eight 20-pounder Q.F. guns, their cost being 2,750,000 francs (£110,000), of which 500,000 francs (£20,000) will be for guns, and 800,000 francs (£32,000) for blockade mines.

Germany.

The "Nautilus" is practically complete, and has been recently carrying out her trials at Wilhelmshaven, and is this month to take up her station at Wilhelmshaven; she has been fitted with an ice-belt, so that she may be able to carry out the work of laying mines in winter when ice may be about.

Docking Accommodation at the Disposal of the German Fleet.—The largest floating dock in the world is at Hamburg, at the Building Yard of Messrs Blohm & Voss. It can lift ships of a displacement of 22,500 tons, and is 756 feet long, with a beam of 88 feet 6 inches. This yard also possesses three other docks capable of taking in vessels of 17,500 tons, 4,500 tons, and 3,000 tons respectively.

The capacity of 22,500 tons of the first dock is obtained by joining a section of the 17,500-ton dock, called the "Elb" dock, with a 17,000-ton pontoon-dock. This dock is constructed in such a manner that its working is independent; it is provided with a central and auxiliary engine, so that in case of war it can be at once towed towards the mouth of the Elbe.

The Reiherstieg Yard possesses two docks capable of lifting two ships of 11,500 and 5,000 tons respectively. The Brandenburg and Stulken Yards also possess two good docks, that of the first being able to take in vessels of 7,200 tons, and of the latter, vessels of 7,000 tons. The largest graving dock belongs to the Hamburg-American Line; it is 400 feet long, with a beam of 60 feet 6 inches; but another dock, 700 feet long, is under construction. The firm of Blohm & Voss are constructing a new dock, which is to be able to take in a vessel of 35,000 tons, and at the Vulcan Yard at Stettin, two very large new docks are being constructed. The dock at Bremen, which is leased by the town to the Norddeutscher Lloyd Co., can compare with the largest docks in England, being 760 feet long, with a breadth of 108 feet. The graving docks at Kiel, with a length of 594 feet and a breadth of 95 feet 3 inches, can take in vessels of the dimensions of the "Dreadnought." The docks at Wilhelmshaven have a similar capacity.

Germany possesses, in addition, some other large docks: that of the Seebeck Yard, at Geestemünde (525 feet long); the Vulcan Yard, at Stettin, which is 510 feet long, and will take in a vessel of 12,000 tons; that of the Weser Yard, which will take in a vessel of 11,000 tons; and two belonging to the Norddeutscher Lloyd, 576 feet and 380 feet long respectively.

Work in the Dockyards.—A nine hours' working day, without any lowering of the wages paid to the men, has been adopted in the dockyards at Kiel and Wilhelmshaven and in the torpedo factories at Friederichsort and Mürwick. A quarter of a hour's rest, without pay, is granted for lunch; the working day is really nine hours and a quarter. On the other hand, steps have been taken to ensure the punctual arrival of the men, and that they do not leave before the proper time. Up to the present the private yards have not followed the example set by Government.—*Marine Rundschau, Revue Maritime, and Neue Preussische Kreuz Zeitung.*

United
States.

Report of Personnel Board (concluded):—

Promotions and Retirements.

12. Officers of more than thirty years' service who may be found so physically disqualified as to be unable to do reserve duty, when such disqualification is the result of an incident of the Service, should be retired in the grade for which examined; officers of less than thirty years' service similarly disqualified should be retired in the grade they then hold.

13. In case the candidate for promotion is found disqualified by reason of professional, mental, or moral unfitness, or by reason of physical unfitness not incurred in line of duty, the Examining Board should have discretionary powers with certain limits to recommend to the Department as follows:—

- a. If the candidate has had less than twenty years' service, that he be dropped or retired with furlough pay, according to his record during his period of service.
- b. If more than twenty and less than thirty years of service, to be retired with one-half or furlough pay, according to his record.
- c. If more than thirty years of service, to be retired with one-half pay of grade.

14. An office of records of officers should be established in the Bureau of Navigation, with the necessary clerical and other assistance, to be under charge of an officer of not less rank than of captain. This office should collect and contain the reports of fitness and other records of officers, including copies of the findings of all judicial and Examining Boards that are applicable and are now existing in the office of the Judge Advocate General. These records, with all pertinent evidence upon the subjects, to be available for presentation to the elimination and all other Boards by the chief of the Office of Records when called for by these Boards.

15. Ordinary promotions should be made as vacancies occur during the year.

16. The number of captains, commanders, and lieut.-commanders should be as may be authorised in each grade, plus those officers who are additional because of war service and acts of Congress, and also those who are now or may become eligible for engineering duty only; provided that all officers who are additional should have the privilege of voluntary retirement and also be eligible for elimination. The percentage of elimination from officers for engineering duty only from any grade shall be the same as the percentage of elimination from the other officers of that grade.

17. The following is recommended as the minimum of the requirements for sea service before promotion, the said sea service to be in the regular duties of their grades in a cruising vessel:—

Captain and commander, 1 year.

Lieut.-commander, 1 year.

Lieutenant, 75 per cent.

Ensign and midshipman, 75 per cent.

Provided that, if when an officer comes up for promotion he lacks the required amount of sea service, his promotion be deferred without loss of date or number until he has performed the requisite sea service; provided that after 1910, or three years after the establishment of this recommendation, the minimum sea service of captains, commanders, and lieut.-commanders be fifty per cent. of service in grade.

*The Naval Academy and Midshipmen and Lower Grades of the Line.*United
States.

18. The number of appointments to the Naval Academy is recommended to be left as now established by law.

19. The age of entrance at the Naval Academy is recommended to be not less than fifteen years nor more than eighteen years, the reduction to go into effect three years after the beginning of the academic year next subsequent to the authorisation of this paragraph.

20. After graduation from the Naval Academy, midshipmen should serve one year at sea and should then be commissioned ensigns without competitive examination, but subject to the examination now required by law for other commissioned officers of the Navy; and ensigns, after two years' service as such or three years after graduation from the Naval Academy, to be promoted to lieutenants (junior grade), subject also to the examinations now required by law, and afterwards to serve three years as lieutenant (junior grade), and then to be promoted to the grade of lieutenant, subject to the examination provided by existing law; provided, further, that all officers now commissioned ensigns be immediately commissioned lieutenants (junior grade), without examination, and after five years from date of their final graduation from the Naval Academy to be promoted to the grade of lieutenant, subject to the examination now provided by law; and provided, further, should this become law, that the class that had their first graduation at the Naval Academy in 1905, or one year from graduation, be immediately commissioned ensigns, without examination, and three years after date of said graduation at the Naval Academy they be promoted to the grade of lieutenant (junior grade), subject to the examination required by existing law.

21. *On promotion of midshipmen to ensigns, any excess in the number of midshipmen above what is necessary to fill vacancies in the grade of ensign, including those recommended in Para. 1 as additional for the year, and such other vacancies in other grades or other corps for which they are eligible, should be discharged from the Service with honourable discharge and one year's pay of grade.* [This provision is approved, but only in connection with the recommendations contained in Para. 4, under the heading "The Naval Academy" in the Secretary's Annual Report, which, if adopted, will render it probably nugatory in a great measure.]

22. Midshipmen after graduation from the Naval Academy should be given the benefits of the retirement and pension laws.

General Recommendations.

23. The Board, while in favour of the amalgamation of the line and former engineer corps, as provided by the present *personnel* law, in a general sense, desires to express the opinion that experience shows that some specialisation for the design and inspection of machinery should be created.

24. That all requirements to the next higher grades provided for in Sections 2,448, 2,449, and 2,461 of the Revised Statutes be no longer authorised by law if these recommendations are carried into effect.

25. The officers and enlisted men of the Navy should have the same privileges of retirement as officers and enlisted men of the Army and Marine Corps, and the provision of Section 1,243 of the Revised Statutes and Chapter 1,125 of the Acts of the last session of the Fifty-first Congress, Act of 30th September, 1890, relating to retirements in the Army and Marine

**United
States**

Corps, should be made applicable to the Navy; but no officer should be permitted to voluntarily retire with less than thirty years' service on the active list except as provided in Section 8, Para. 6, of this report.

26. *The Board recommends that from this time henceforth no additional officers from the retired list of and above the rank of commander be employed upon duty for which officers on the active list are eligible, and that as soon as practicable those officers now so employed be relieved by officers from the active list or from the proposed reserve list. [This provision is disapproved.]*

27. These recommendations, if carried out, would involve the modification or repeal of Revised Statutes, Sections 2,340, 2,341, 2,445, 2,448, 2,449, 2,450-2,457 (2,461), 2,464, 2,466, 2,467, 2,473-2,480, 2,503-2,516, 2,531, 2,534, 2,537, 2,538, 2,599, as to pay of midshipmen.

28. The Board recommends that Section 1,442 of the Revised Statutes (giving the Secretary of the Navy authority to place any officer on the active list on furlough) be amended by adding the words "on his own request" after the words "active list of the Navy."

29. There should be appointed an assistant to the Chief of Bureau of Equipment, the appointment to be made in the manner now provided by law for assistants to chief of bureaus.

Retired List.

30. Retired officers of the Navy, who have been retired for disabilities resulting from an incident of service, ordered to active duty, should have the rank, pay, and allowances of officers of the active list of like length of active service, and if actively employed for three years after retirement, when detached from duty, retain the rank and highest retired pay of the grade they then hold; *provided that no retired officer so employed on active duty shall have at any time the rank and pay of grade higher than that of lieut.-commander. [This provision is disapproved.]* The time of service of the retired officer, for the purpose of fixing his rank, pay, and allowances, to be made up of the period of service before retirement, to which should be added the time engaged in active service, under the order of the Secretary of the Navy, while on the retired list; provided, further, that the rank and pay of any officer on the retired list should not thereby be reduced.

Warrant Officers.

31. The provisions of the law governing the examination of boatswains and gunners for commissions as ensigns should be extended to include chief boatswains and chief gunners.

32. The pay of boatswains and gunners should remain as now fixed by law, except that they should have the ten per cent. increase of pay for shore duty beyond seas allowed other officers of the Navy.

33. Boatswains and gunners who are or have been promoted to chief boatswains and chief gunners, to rank with but after ensigns, should suffer no reduction in pay on account of such promotion, but continue to receive the higher pay until the pay of the rank to which they are promoted is equal to or higher than that they were receiving at the time of promotion.

34. The pay of chief boatswains and chief gunners to be as follows:—

	Dollars.
First five years from date of appointment ...	1,400
Second five years from date of appointment ...	1,600
Third five years from date of appointment ...	1,800
After fifteen years from date of appointment ...	2,000

Memorandum on Foregoing Notes.

The provisions in Para. 5, for which the Department suggests different language, are objectionable in that they apparently seek to limit the discretion of the President in appointments to the office of vice-admiral. The Department regards such limitations as of doubtful constitutionality, and, in any event, as inexpedient. The Department, however, approves cordially of the provision for obtaining advice of officers of high rank to assist the President in the discharge of his constitutional duty.

The provisions noted as objectionable in Para. 8 seem to overlook the possibility that they may affect officers who are not graduates of the Naval Academy. While such a contingency would be altogether exceptional under existing circumstances, as matter of law it should be guarded against. The Department holds that officers on the retired list who receive compensation from the Government should not be permitted to assume duties which oblige them to protect interests hostile to the Government. This appears to the Department inconsistent with sound business principles, and might be attended by more or less serious abuses in practice.

Para. 10 is disapproved because the Department thinks the subject to which it relates should be covered by naval regulations and not by statute, and also because the Department thinks as much latitude as possible should be permitted respecting the assignment of officers on the contemplated "reserve list." As far as practicable, officers on this list should, in the judgment of the Department, be employed in all shore duties, so that officers on the active list may be all available for sea duty at any time.

Para. 21 is unobjectionable, but if the Department's recommendations, in the fourth paragraph, under the heading "The Naval Academy," of the Secretary's Report for 1906, that all vacancies in the lowest grades of the Pay Corps and Marine Corps be filled from graduates of the Naval Academy, and that undergraduates be allowed to take special courses which, when supplemented by a suitable postgraduate course, will fit them for commissions in the Medical Corps or as civil engineers, be adopted it seems altogether improbable that an appreciable number of midshipmen will have to be discharged from the Service, as required by the terms of this paragraph.

Para. 26 is disapproved because the Department holds that the employment on active duty of officers on the retired list, in assignments which they are competent to fill satisfactorily, is desirable as affording the Government a direct return for the expense it incurs in their compensations, and therefore the opportunities for such employment should not be abridged.

The part of Para. 30, forbidding a retired officer on active duty to have a higher rank or pay than that of lieutenant-commander appears to the Department altogether indefensible. A retired rear-admiral, for example, ordered to duty on a court-martial would regard it as an indignity if a commander on the active list forming part of the same court were given precedence over him. It may be here noted that the language of this entire paragraph is somewhat obscure, although, as construed by the Department, its provisions seem to be unobjectionable, except in the particular above noted.

As stated in the Annual Report, with the exceptions indicated above, the report of the Board on Commissioned Personnel is very cordially approved by the Department, and strongly recommended to the favourable consideration of the Congress.—*U.S. Army and Navy Journal.*

United
States

Accompanying the report of the Board on Navy *Personnel* is a series of tables showing the effect of the changes proposed. There would be a net annual decrease in costs as follows:—Fiscal year, 1907-8, 30,470 dollars; 1908-9, 123,300 dollars; 1909-10, 267,500 dollars; 1910-11, 385,550 dollars; 1911-12, 465,850 dollars; 1912-13, 517,100 dollars; 1913-14, 589,800 dollars. The saving in the active list during the seven years would be 2,384,850 dollars; deducting 1,305,000 dollars for the cost of the reserve list, leaves net, 1,079,070 dollars. To this is to be added the saving in the cost of the retired list, 4,000,552 dollars, showing a total proposed saving to the Government during the seven years of 5,083,622 dollars. The number of officers under existing laws will be as follows:—1907-8, 1,029; 1908-9, 1,092; 1909-10, 1,440; 1910-11, 1,563; 1911-12, 1,724; 1912-13, 1,856; 1913-14, 1,990. The figures for these several years under the proposed law will be as follows:—1,029, 1,092, 1,158, 1,227, 1,297, 1,369, 1,441. The number of officers and the age of the juniors as they are now as they will be in 1913-14 under the proposed law are shown by the comparison which follows:—

	EXISTING LAW.		PROPOSED PLAN.	
	No.	Age of junior.	No.	Age of junior.
Vice admirals			6	57 0
Rear admirals	18 (5)	60 8	21 (3)	54 11
Captains	70 (14)	54 3	95 (10)	43 6
Commanders	112 (10)	46 7	95 (10)	41 3
Lieutenant commanders	210 (10)	35 7	257	33 0
Lieutenants	329 (7)	27 0	380	28 0
Junior lieutenants	0		347	25 0
Ensigns	246	24 0	244	23 0
Midshipmen	155	23 0		
Total	1,163		1,441	

Report Bureau of Equipment.—The Chief of the Navy Bureau of Equipment reports that the appropriation of last year (7,787,148 dollars) was adequate except for a deficiency of 500,000 dollars for coal and 3,000 dollars for contingencies. Of coal, 672,867 tons were purchased at an average of 4 dollars 20 cents per ton, including transportation, 85 cents a ton less than last year, and 48 cents less than in any one of the past fifteen years. The requirement that coal should be transported in American bottoms has been a source of embarrassment and expense. The amount purchased was 21 per cent. greater than last year. A statement is given of the status and capacities of the various naval coal depôts. Experiments with oil fuel are being made on the "Wyoming." It is recommended that future battle-ships should carry liquid fuel in double-bottoms as reserve fuel. This would not interfere with the space required for other purposes. Burning oil in port, the vessel could sail with full bunkers, and the expense of removing ashes in port would be avoided. This would be equivalent to several hundred tons of coal. Agreements for a supply of coal have been made with eighty-one dealers in foreign ports.

Repairs to ships and ship equipment have been made at the different Navy Yards as follows:—Portsmouth, N.H., eighty-one vessels, besides two coal barges and yard launches; Boston, seventy, and equipment outfits for twenty-two new ships; Brooklyn, N.Y., forty-one ships, and illuminating outfits for nine ships; League Island, twenty-seven ships; Norfolk, Va., eighty-four ships; Key West, Fla., minor repairs to four ships; Mare Island, thirty-four ships, and original outfits for four ships; Puget Sound, thirteen ships; Cavite, P.I., forty-one ships, besides fifteen for the insular bureau of navigation; Washington, D.C., six ships received minor repairs.

The output at Norfolk has been increased in proportion to the amount expended by the centralisation of the equipment plant, which has permitted closer inspection. A coaling plant is needed at this yard, a house for the equipment officer at Charleston, a better water supply for Key West, a repair-ship, and a house for the equipment officer, an extension of the observatory building at Mare Island, more space in the rigging loft at Puget Sound, and quarters for the equipment officer; eight additional coal barges at Cavite, a building to cost 60,000 dollars at Guantanamo for officers, etc., and repair shop to cost 30,000 dollars, a house for the equipment officers at Hawaii station, better coaling facilities at Guam.

At Boston there was a reduction of 9.44 per cent. in the cost of chain-iron and billets, and 14 per cent. in chains, due to increased facilities. A further reduction of 10 per cent. in the cost of chain cables can be obtained by the installation of a link-bending and scarfing machine.

At the electric testing laboratory, Brooklyn, 2,341 tests were made, an increase of 12 per cent. over last year. By purchase and distillation 117,874,114 gallons of water were obtained at an average of 41.2 cents per 1,000 gallons. Thirty-one vessels have been supplied with libraries numbering 31,520 volumes and costing about 50,000 dollars. These libraries range from 225 volumes to 2,000. For pilotage, 44,576 dollars 86 cents were expended, and 15,151 dollars 25 cents for canal tolls. Sixteen branch hydrographic offices are in operation. Compass ranges have been laid out for the use of merchant-vessels of the Lakes. Of charts, 120,423 have been printed; of the charts, twenty-seven are confidential. Sixty-two officers are on duty under the bureau. The clerical force are commended for faithful and efficient service. Of wireless telegraphy the report says:—

“The progress made in wireless telegraphy during the past year has been very great, and the results achieved highly satisfactory. It is the policy of the bureau to purchase different types of wireless apparatus from the various manufacturers in this country for installation in ships and shore stations, in order to encourage competition. It is believed that this method of procedure, together with the stimulus afforded by prospective commercial profits, has produced a development of the art in this country equal if not superior to that attained abroad. It appears, however, that the commercial possibilities of wireless telegraphy are not as great as originally anticipated, since the revenue derived therefrom is small, and apparently not commensurate with the cost of installation and maintenance of coastwise long-distance stations. But the value of wireless telegraphy for the purpose of national defence is inestimable. It is therefore essential that absolutely reliable communication at the longest possible distances be maintained between naval ships at sea, between ships and shore stations, and between the shore stations themselves along our coasts and outlying possessions. With this end in

United States.

view, a complete chain of stations has been established along the Atlantic and Gulf coasts, in the West Indies, and on the Isthmus of Panama, and a chain is being completed on the Pacific coast from Tatoosh Island to Cape Flattery. Stations have also been established in the Hawaiian Islands and at Guam, and preparations are under way to establish a complete chain of intercommunicable stations in the Philippine Islands.

"These coastwise stations are always ready to receive and transmit to their destination messages from ships at sea. The Department performs this service free of charge, and has made arrangements with the telephone and telegraph companies in this country to forward such messages without prepayment. The Department's stations on the Pacific coast, acting in conjunction with naval vessels, were of especial value during the San Francisco disaster in April, 1906, furnishing for a considerable time the only reliable means of quick communication with the outside world. Excluding the installations on foreign naval vessels (and it may be assumed that all ships of importance are so equipped), the United States has in operation more than half of all the wireless installations in the world.

"Sites have been selected for a number of stations in the Philippine Islands and for an additional station in the Canal Zone, near Panama. The noon-time signal service is being extended to all Atlantic and Pacific coast stations, and connections are being made with local telegraph and telephone lines, especially those of the Life-Saving Service and the Weather Bureau. The following vessels, not previously fitted, have been equipped with wireless telegraph sets during the year: "Brutus," "Cesar," "Charleston," "Don Juan de Austria," "Dubuque," "Lawton," "Lebanon," "Marietta," "Paducah," "Supply."

"Experiments relative to the usefulness of wireless telegraphy on submarines are in progress, but have not been concluded. It is doubtful, however, if the use of wireless telegraphy on submarines will be of value. Steps have been taken towards making the stations at the Washington and New York Navy Yards directly intercommunicating, day and night, for use as testing and experimental stations."—*U.S. Army and Navy Journal*.

MILITARY NOTES.

Home.

The following are the principal appointments which have been made:—

Major-Generals—T. Perrott, C.B., from Commander Coast Defences, Scotland, to Command Troops in the Straits Settlements. L. Denning, C.B., D.S.O., I.A., to be a Divisional Commander, India. J. E. Boyes, C.B., to be Colonel of Princess Louise's (Argyll and Sutherland Highlanders).

Colonels—S. H. Winter to be Assistant-Director of Supplies at Woolwich Dockyard. H. D. Fanshawe, from 2nd Dragoon Guards (Queen's Bays), to be a Brigadier-General to Command a Cavalry Brigade, with the temporary rank of Brigadier-General while so employed. G. C. Kiteon, C.V.O., C.M.G., to be a Brigade Commander, India, and to be temporary Brigadier-General while so employed. J. H. Poett, C.B., to be a D.A.G., India, and to be temporary Brigadier-General while so employed. A. R. Pemberton, from h.p., to be Deputy Judge Advocate. G. V. Kembell, C.B., D.S.O., from h.p., to be an A.Q.M.G. G. W. H. Pain, C.B., from h.p., to be a Colonel in charge of Records.

Annual Report of Recruiting for the Year ended 30th September, 1906. **Home.**
—The Report is divided into four parts:—

1. General Observations on Recruiting for the past year.
2. Army Reserve.
3. Militia and Imperial Yeomanry.
4. Civil Employment of Discharged Soldiers and Reservists.

1. *General Observations on Recruiting.*

The number of recruits who joined the Regular Army, excluding those for Colonial Corps and re-enlisted men, for the twelve months under review amounted to 36,410, and for the Militia to 28,732. The total for the Regular Army shows an increase of 1,059 as compared with the previous twelve months, while that for the Militia shows a falling off of 1,209.

The reductions, proposed and impending, in the establishment of the Army, to a certain extent dislocated ordinary recruiting arrangements, in some arms necessitating the restriction of recruiting, and in others the adoption of special measures, such as conversion of service, to reduce the establishment and thus enable recruiting to be maintained for other arms without exceeding the numbers voted.

To meet the reduction in establishment in consequence of the decision of the Government to reduce the Army, and at the same time to avoid a complete block in the promotion of younger non-commissioned officers, special measures have been necessitated.

Notice has been given that non-commissioned officers and men, of the corps concerned, were not to be allowed to continue in the Service beyond 21 years, the period for which they have re-engaged. In the case of those enlisted as boys, the completion of 21 years is reckoned from the date of attaining 18 years of age; in other words, the boy's service does not reckon. In the case of non-commissioned officers and men who have already completed 21 years' man's service, several months' notice has been given, with a view to enabling those concerned to endeavour to obtain civil employment. As regards non-commissioned officers serving on the Permanent Staff of Auxiliary Forces, these orders have obliged us to discharge non-commissioned officers, who, by the Regulations, in ordinary circumstances are allowed to serve on up to the age of 50, or, in special cases, up to the age of 52. The result will be to throw on the labour market a considerable number of elderly men with wives and families, who, although they have earned their pensions, may find it difficult to obtain civil employment.

Careful enquiries have been made during the past year as regards the physical training of recruits at depôts. The Inspector of Gymnasia has been in constant communication with this office on the subject, and steps have been taken to ensure the close co-operation of the medical authorities with the Gymnastic Staff on this important matter. He has, in conjunction with the medical officers in charge, made tours of inspection of the several depôts. There has been reason to fear that in the past too much importance has been laid upon smartness in drill, rather than upon the gradual physical development of the recruits' powers, with the result that in some instances recruits have been overstrained. The subject has been considered of such importance that special arrangements have been made, by which the services of an officer of the Danish Army have been obtained, and he has been attached for a year to the Headquarter Gymnasium at Aldershot. The system of

Home. gymnastics and physical training in the Danish and Swedish Armies has been brought to a high pitch of efficiency, and it is hoped to model the system of the physical training of our Army on similar lines, and, while preserving the necessary military requirements, to keep in view the important physical principles on which the system is based. The Gymnastic Staff of Instructors are gradually being grounded in these principles, being withdrawn from the several depôts for this purpose, and it is hoped, when the new syllabus of instruction now being drawn up is completed, that valuable results will be obtained by the changes made. The important factor in the new course is the greater prominence given to "free" exercises, that is, exercises with the body, arms, legs, etc., as compared with "fixed" exercises, with apparatus, bars, etc.

In consequence of remarks made by His Royal Highness, the Inspector-General of the Forces, commenting on the physical training of the Royal Horse and Royal Field Artillery, in his annual report to the Army Council, a circular was sent round to all general officers commanding-in-chief at home, calling attention to the advisability of giving all artillerymen a short daily exercise in physical drill. This is the more necessary as the new Q.F. field gun and carriage is a heavy one, and the capability of gunners enlisted under the present standard to handle it efficiently must in a great degree depend on their physical training and development.

The reports on the characters of recruits continue to be satisfactory, and now that the Bill has been passed by Parliament, dealing with the penalties which may be enforced on the production of false characters, it is hoped that the number of undesirable men entering the Service under false pretences will be materially diminished.

In September, 1906, the following alterations were made in the terms of enlistment of the corps mentioned below:—

The Royal Horse and Royal Field Artillery.—All enlistments, except of boys, to six years with the Colours and six years with the Reserve, instead of three years with the Colours and nine years with the Reserve.

Royal Garrison Artillery.—All enlistments, except of boys, to eight years with the Colours and four years with the Reserve, instead of nine years with the Colours and three years with the Reserve.

Infantry of the Line.—All enlistments, except of boys, to seven years with the Colours and five years with the Reserve, instead of nine years with the Colours and three years with the Reserve.

In all these cases, as had already been done as regards the cavalry, the liability of the extra year's service, if abroad, was re-introduced.

Infantry of the Line.

It has been found possible to temporarily raise the standard of height for a few units of infantry of the Line which were not in want of recruits.

Cavalry.

Recruiting for the cavalry of the Line has been, generally speaking, in full force during the past year, and the figures in consequence show a large increase over those of the preceding year, when recruiting was partially restricted, namely, 3,666 as compared to 2,375.

R.H. and R.F.A.

Recruiting for the Royal Horse and Royal Field Artillery has been subject to modifications during the year, but the total enlisted has been

more than a thousand higher than during the preceding twelve months. Recruiting for drivers has been stopped during the summer months of the current year.

Home.

R.G.A.

The raising of the standard for recruits for this arm has resulted in less recruits being taken than in the preceding year, but, on the other hand, owing to the reductions of establishment the numbers enlisted have sufficed.

R.E.

Recruiting for the Royal Engineers has been satisfactory during the past year.

Foot Guards.

Recruiting for the Foot Guards shows a decrease over the numbers taken during the preceding year, but, as was to be expected, the high standard at which recruits are taken for the Scots and Irish Guards is partly responsible for this diminution in numbers.

Each regiment of Foot Guards has now been allotted a definite number of appointments on the Permanent Staff of the Militia and Volunteers in the districts affiliated to it for recruiting purposes. The non-commissioned officers of the Guards so employed will be able to further the interests of their regiments and to secure for them the stamp of recruit that it is of importance they should obtain.

Infantry of the Line.

Recruiting for the infantry of the Line shows a material decrease over the figures taken in the preceding year.

The decrease amounts to 1,396 men.

The decline was marked during the first six months of the year, but after that a considerable recovery took place, practically coinciding with the restriction of recruiting for drivers in mounted corps. Recruiting for the Northumberland Fusiliers, Royal Warwickshire Regiment, Lancashire Fusiliers, and Manchester Regiment was entirely closed towards the end of July, consequent on the decision of the Government to abolish the 3rd and 4th battalions of each of these regiments.

The following table shows the total number of recruits joined (exclusive of those for Colonial corps), the numbers taken under any of the standards, and the percentage under standard, during the twelve months ended 30th September, 1906, as compared with the previous four years :—

—	1902 ¹		First 9 months of 1903.	Year ended 30.9.04	Year ended 30.9.05.	Year ended 30.9.06.
	During first quarter.	During remaining quarters.				
Total Recruits joined ...	13,103 ²	37,650 ²	23,183	41,279	35,351	36,410
Number under any of the standards	3,943	4,297	1,722	531	220	460
Percentage under standard	30.1	11.4	6.1	1.2	0.60	1.26
	16.2					

¹ The table has been divided into two parts for 1902, owing to the introduction of a new system of medical examination, which commenced in the second quarter of the year, under which the number of men specially enlisted has considerably decreased.

² Excluding men specially raised during the war, and ex-soldiers re-enlisted under Army Orders 106 of 1900.

Home.

It will be seen that there is a small increase in the percentage of the recruits enlisted under standard. This increase is due to the fact that when standards of individual corps are materially raised, recruits who, by reason of their relations' service, have claims to enlist in any particular corps, are sometimes taken if conforming to the old standard, though slightly under the present one.

The number of men who deserted, and of those who rejoined from desertion, during the past five years is given below :—

Year.	Total desertions.	Number re-joined from desertion.	Net waste by desertion.	Recruits joined. ¹	Percentage of net waste to Recruits joined.
1902	7,162	2,851	4,311	50,753	8·5
First 9 months of 1903	4,653	2,241	2,412	29,324	8·2
12 months ended 30th Sept., 1904.	3,959	2,673	1,286	42,071	3·0
12 months ended 30th Sept., 1905.	3,082	2,189	893	35,824	2·5
12 months ended 30th Sept., 1906.	2,979	1,725	1,254	37,099	3·4

¹ Excluding men specially raised during the war and ex-soldiers re-enlisted under A.O. 106, of 1900, and A.O. 35 of 1903, but including Colonial corps.

2. Army Reserve.

The strength of the Army Reserve shows a large increase over the numbers on the 1st October, 1905, and compared with the 1st October, 1904, the difference is very marked. The full effect of the system of three years' enlistments which commenced in 1902, and which has since been discontinued, is now being realised. It has resulted in large numbers of men passing to the Reserve on the expiration of their Colour service, and in addition these numbers are swelled by the premature passage to the Reserve of men of those corps in which reductions of establishment have taken place and conversions of service have been permitted.

The following tables (A and B) show the strength of the Army Reserve, the numbers belonging to the various arms of the Service, and to each section of the Reserve:—

A	Arms of the Service.													
	Date.	Household Cavalry.	Cavalry.	Royal Artillery.	Royal Engineers.	Foot Guards.	Infantry of the Line.	Army Service Corps.	Royal Army Medical Corps.	Army Ordnance Corps.	Army Post Office Corps.	Army Pay Corps.	Colonial Corps.	Total strength.
	1st Jan., 1902	...	285	927	243	237	342	206	8	5	42	1	102	2,398
	" 1903	...	2,028	4,881	1,559	3,904	18,656	1,278	328	55	48	8	125	32,865
	1st Oct., 1903	...	5,599	7,841	2,657	5,790	40,403	2,488	1,095	130	198	17	253	66,471
	" 1904	17	5,773	8,895	2,996	6,281	45,885	3,093	1,280	127	237	17	339	74,940
	" 1905	40	7,298	11,881	3,691	6,874	59,269	3,471	1,441	215	242	20	428	94,770
	" 1906	51	7,464	15,192	4,052	7,488	69,924	3,998	1,589	272	130	¹ 436		110,596

¹ Omitted.

Home.

B Date.	Numbers provided for in Army Estimates as probable maximum.	Volunteers.	Sections of the Army Reserve.				
			Section A.	Section B.	Section C ¹ .	Section D.	Total strength.
1st Jan., 1902 ...	80,000	1	..	933	233	1,231	2,398
" 1903 ...	70,000	...	328	28,759	697	3,081	32,865
1st Oct., 1903 ...	70,000	...	2,921	55,165	1,741	6,644	66,471
" 1904 ...	80,000	...	2,564	62,190	... ¹	10,186	74,940
" 1905 ...	104,000	...	4,133	75,257	...	15,380	94,770
" 1906 ...	122,000	...	3,677	87,943	...	18,976	110,596

¹ Section C has been merged into Section B.

In consequence of the large number of men in the Reserve, enlistments in, and re-engagements for, Section D of the Army Reserve were suspended from 1st July, 1906. This suspension did not affect the re-engagement of men in Section D for further periods, who form the supplemental reserve of tradesmen, and who are allowed to continue in Section D up to 50 years of age.

3. Militia and Imperial Yeomanry.

As already stated, the number of recruits obtained for the Militia shows a decrease of 1,209 over the previous year, and the strength of the force has diminished in the same period from 85,814 to 83,720. This continued reduction may partly be ascribed to the higher standard for Militia recruits, which came into force in November, 1904, but it is probably owing, also, to the future of the Militia being still undetermined, and, in addition, to the fact that the older Militiamen do not remain in the force as long as formerly.

Reports on the recruits enlisted into the Militia are generally satisfactory, though, as was to be expected, the physique is lower than that for the Regular Army, but it rapidly improves after enlistment. The character and education of the recruits is favourably reported on.

An experiment has been made in the case of 20 battalions by extending the period of training for recruits in these units to a period of 6 months, instead of 49 days on enlistment. Certain battalions which are accustomed to conduct recruits' drill immediately before the annual training were allowed, if they desired, to apply the same principle to the 6 months' preliminary drill. Recruits who have not completed 6 months' training prior to the date of the annual training, may be permitted to continue this training, as recruits, with the headquarters of their battalion. Recruits will be required to attend the annual training, if it commences more than 3 months after the completion of the preliminary training, otherwise attendance at the annual training is optional. Funds have been taken to provide for billeting recruits, who cannot be accommodated in barracks, and they are also permitted to live at their own homes and draw lodging allowance. As the experiment has only just commenced, it is premature to form any opinion as to the result. Careful statistics are being kept in order to determine: whether this system is more popular than that of drilling for 49 days only on enlistment, whether recruits are being diverted from the other Militia battalions of the units

Home. concerned, and also what effect the experiment will ultimately have on recruiting for the Regular Army. Enlistment into the Regular Army from these battalions must undoubtedly diminish in the first instance, as recruits are not permitted to enlist until they have completed one annual training.

Four additional companies have been added to the Royal Army Medical Corps Militia, in consequence of which a re-allotment of the several recruiting areas for the corps has taken place.

Recruiting for the Royal Engineer Submarine Mining Militia has been entirely suspended, owing to the abolition of this branch of the Militia.

The future of the Royal Garrison Artillery Militia is still uncertain, and recruiting for some of the units in Ireland remains closed.

A few enlistments still take place for the Reserve Division of the Militia from the men of the Royal Garrison Regiment, who have the right to pass into this Reserve.

The aggregate strength of the Militia by arms and distribution is as follows:—

Serving on the	English.	Scotch.	Irish.	Total.	Arms.				Total.
					Royal Artillery.	Royal Engineers.	Infantry.	Royal Army Medical Corps	
1st Jan., 1902	72,764	11,182	18,899	102,845	14,382	1,959	85,936	568	102,845
" 1903	72,694	11,481	18,245	102,420	13,878	1,969	85,741	832	102,420
1st Oct., 1903	62,455	10,210	17,078	89,743	13,310	2,049	73,643	741	89,743
" 1904	59,287	10,048	17,156	86,491	13,352	2,020	70,421	698	86,491
" 1905	57,601	10,238	17,975	85,814	13, 54	2,154	69,629	777	85,814
" 1906	54,914	10,239	18,567	83,720	12,659	2,063	68,001	997	83,720

Imperial Yeomanry.

The Imperial Yeomanry on 1st October, 1906, was 2,016 under establishment, thus showing a slight gain during the current year. The number of recruits joined amounted to 5,952, as compared with 4,060 for the preceding twelve months. This satisfactory result would tend to show the increasing popularity of the force.

It was represented that a certain number of Imperial Yeomen who had been enrolled before the passing of the Militia Act of 1901, and whose term of service was practically unlimited, would agree to come under the Act of 1901 if allowed to engage for one year at a time only. As it is desirable that all Yeomen should be serving under the same conditions and liabilities, permission was given that enrolments of old Yeomen might be for one year at a time only. Such short enlistments do not, of course, prevent the men from re-engaging for further periods.

The subjoined table shows the increase and decrease in the Imperial Yeomanry during the year ended 30th September, 1906:—

Home

Strength on 1st October, 1905	23,587
Totals.	
INCREASE—	
Recruits joined	5,952
Re-enlisted	106
Joined from desertion	4
Other causes	16
Total increase	6,078
DECREASE—	
Died	68
On termination of engagement	4,602
As invalids	83
Recruits rejected after attestation... ..	5
Mis-statement as to age	20
Discharged { By purchase	638
On conviction of felony	7
For misconduct other than felony... ..	27
Other causes	33
Deserters struck off	313
Joined { Regular Army	111
Royal Navy or Royal Marines	3
Other causes	19
Total decrease	5,929
Net increase	149
Strength on 1st October, 1906	23,736

4. Civil Employment.

A Committee, of which Sir E. Ward was Chairman, was appointed during the past year to consider the question of civil employment for Army Reserve men and discharged soldiers, and also whether the work of the Societies dealing with this important question could be improved, and whether better results could be obtained by the amalgamation of the several Societies. A considerable amount of evidence was taken by the Committee, both from members of the Societies themselves, employers of labour, and from military sources. A valuable report has been presented dealing with the whole subject, the principles of which have been generally approved by the Army Council. The Committee reported in favour of amalgamating the several voluntary Societies, thus saving the multiplication of staff, and promoting economy in administration. The report of the Committee has been for some time under the consideration of the Government, and it is hoped that steps will be taken to give effect to its recommendations. Among other questions dealt with by the Committee was that of the character given to soldiers on leaving the ranks, and it was suggested that more information should be given in soldiers' character certificates, and thus enable civilian employers to form a better idea of the qualifications of a soldier for civil employment. This question is under consideration, and proofs of an amended certificate are being circu-

Home.

lated for discussion. In view of the recommendations made, circulars have been sent round to general officers commanding-in-chief requesting them to consider the best means of rendering the soldier while serving more fitted to take his place in civil life when passed to the Reserve or discharged. It is hoped that it may be possible to teach soldiers certain trades during their military service, although it is fully recognised that the opportunities for such instruction vary at different stations.

To enable soldiers about to be transferred to the Reserve or discharged to obtain information as to the state of the labour market in the towns where they were contemplating taking up their residence, a circular was issued towards the end of 1905 directing general officers commanding at home and abroad to issue instructions to officers in charge of records to forward monthly to the several units with which they are connected, a statement showing the condition of the labour market in the different centres in their areas. In addition, these officers were directed to furnish information as to the number of ex-soldiers who had already registered their names as seeking employment, and to state what prospects exist of providing this number with employment, and whether there is reasonable hope of other men finding employment in the district.

The War Office and the Post Office have had considerable correspondence during the past year on the subject of civil employment for ex-soldiers. Among other questions which have been considered was a suggestion that there were opportunities of employing a few military telegraphists temporarily in the Central Telegraph Office at St. Martin's-le-Grand, in London. It was proposed that a number of qualified soldiers, preferably in their last year of service, should be lent to the Post Office during the pressure of work, which is always heavy at certain seasons of the year. The men, of course, would have to be competent operators, and in addition to their regimental pay would draw a special allowance from the Post Office. The names of candidates were called for, and about 30 were submitted to the General Post Office. It was thought that the temporary employment of these men might be of benefit both to the War Office and the Post Office, since the latter would be able to avail itself of their help during pressure of work, while the experience afforded to the men might lead to their permanent appointment as telegraphists. It was subsequently ascertained that owing to the late period at which the suggestion was made, the season was too far advanced to make it practicable to make use of the men's services last summer. It is, however, proposed to initiate the experiment next summer, and in the meantime the Post Office has arranged to offer immediate employment to about 12 of the 30 soldiers whose names were submitted. These men will be placed on duty as probationary telegraphists, and if they prove satisfactory will be appointed to established posts as telegraphists as vacancies occur, probably after about 12 months' probationary service. Such appointments will necessarily depend on the efficiency of the probationer; the pay offered to probationers is 24s. a week, but on appointment the salary would probably be somewhat higher.

General Remarks as to Civil Employment.

The following table records the number who left the Colours with characters entitling them to registration for civil employment. The actual number for whom employment was found by means of Official Registers, Employment Societies, and Departments under the War Office is shown below. It will be seen that while 26,193 men have returned to

civil life from the Army with characters either Good, Very Good, or Exemplary, no less than 21,985 ex-soldiers have either been provided with employment or have had situations to go to:—

Home.

Number discharged or transferred to the Reserve with	{	"Exemplary" characters	...	...	...	2,136
		"Very good" characters	...	...	...	13,631
		"Good" characters	...	...	...	10,426
		Total	...	..	...	26,193
Number of men for whom employment has been found	{	Departments under the War Office.	War Office Register (Messengers, &c.)	...	...	64
			Regimental and Recruiting Registers (affiliated to National Association)...	...	...	6,268
			National Association (London office only)	...	...	1,661
			National Association (Branches)	...	...	1,003
			Soldiers' and Sailors' Help Society (London office only)	...	...	902
			Army and Navy Pensioners' Employment Society...	...	...	835
			Guards' Employment Society	...	...	145
			Army Clothing Department	...	5	870
			Works and Fortifications Department	...	24	
			Ordnance Factories	...	99	
			Barrack Wardens, Barrack Labourers, &c.	...	406	
			Army Ordnance Department	...	326	
			Clerks in War Office	...	3	
			Writers under Army Accounts Department	...	7	
			To these may be added	{	Men who are known to have themselves obtained employment	...
General Total						21,985

It will be noticed that the returns from the Regimental and Recruiting Registers in out districts affiliated to the National Association show a gratifying increase. A considerable number of letters are received in this office from private employers and industrial concerns, asking for ex-soldiers to fill situations. These applications tend to show what employers of labour are not yet fully aware of the local societies for the employment of ex-soldiers, and that these societies are not sufficiently advertised.

Concluding Remarks.

As has been already pointed out, there is a slight increase in the number of recruits taken as compared with the preceding year. The unsatisfactory feature has been the decrease in recruiting for the Infantry of the Line, which is always affected by the requirements of the mounted corps. The conditions under which recruiting has been conducted have been, to say the least of it, unsettled. Again, the reductions in establishment which have taken place, and the consequent closing of recruiting, are disturbing factors. As regards the Militia, the continued uncertainty of the future of the force cannot fail to have a bad effect.

Recruiting on the whole may be considered satisfactory, with the exception of that for the Infantry of the Line. Now that a definite settlement has been arrived at regarding the terms of service of this arm, it is certain to improve in recruiting, and in fact is doing so already. Owing to the paucity of extensions among the recruits enlisted for three years, the demands on the home infantry battalions for drafts for abroad

¹ Temporary employment has been found for 1,687 in addition to the above figures.

Home. have been very heavy. These excessive demands have led to depleted home battalions, and, in consequence, harder work upon the older soldiers. After this trooping season the demands for drafts should materially diminish, as nearly all the men enlisted for three years' Colour service will have passed to the Reserve. With a longer term of Colour service, and a diminished draft requirement, it should be possible in the future to provide the annual draft without undue depletion of the unit, and at the same time preserve in the unit a proportion of men in each year of service not required for draft purposes. Battalions will then again have that backbone of old soldiers, which is lacking at present, and which is necessary to the efficiency of the unit.

Wastage, however, should be considered in conjunction with recruiting, and it is satisfactory to note that substantial decreases have occurred in what may be termed preventable sources of wastage. Taking, for example, invalids, men discharged as not likely to make efficient soldiers, and men discharged for misconduct; the discharges for these causes amounted to 6,603 in the year under review, as against 9,138 in the previous year—the equivalent of 2,500 extra recruits.

The reports received from the several commands tend to show that the stamp of recruit that we are now obtaining is satisfactory. His physique is, on the whole, good, and the system of medical inspection, which provides an inspecting medical officer in each command, ensures a more experienced selection of recruit than heretofore. The recruit at the dépôt is well behaved, his education is in nearly every case favourably reported on, and is stated to be decidedly improving, whilst in some districts the class of recruits has improved.

The changes mentioned in my report of last year caused by the grouping of regimental districts have worked satisfactorily. It was found, however, that while the younger officers showed great interest in supervising the recruiting of the regimental district in their charge, in many cases, owing to a want of experience in recruiting work, they did not thoroughly appreciate the methods by which the best results could be obtained.

One important step has recently been taken, which it is hoped will improve the soldier's status both in his own estimation and in that of the country. There are many offences of a purely military nature, and in no way affecting a soldier's character in civil life, for which, under the military code of punishment, imprisonment has been awarded. The term "imprisonment" to a civilian mind implies a more or less serious infraction of the country's laws. A soldier, therefore, who has undergone a term of imprisonment for a purely military offence has thus been branded in the eyes of the civil population as a man who has committed a serious crime, and, in fact, become a member of the criminal classes. Soldiers punished for purely military offences are no longer sentenced to imprisonment, but to detention. A sentence of detention is carried out in a detention barrack under a system which aims at returning the soldier to his unit on the termination of his punishment with his military knowledge, technical skill, and civil education increased, and his physical condition improved. While undergoing a sentence of detention a soldier retains his uniform, arms, and equipment, and, though the daily routine is necessarily severe and the work arduous, it is not of a nature to impair that self-respect which is so necessary for the efficient performance of a soldier's duty.

Bad characters, whose serious military offences call for discharge from the Army, and soldiers convicted of offences cognisable by the criminal law of England, are ordinarily sentenced to imprisonment and do not

return to the Army. The sentence of imprisonment in these instances is served at the military prison when the offence is a military offence, and in a civil prison in other cases.

Reference has been made to the important Committee which assembled, under the presidency of Sir Edward Ward, to consider the question of the civil employment of soldiers. Several districts in their annual reports have stated that, if the recommendations of that Committee were carried out, the recruiting problem would be solved, and there is no doubt whatever that the adoption of the recommendations would go a considerable distance towards the solution. Many men of a better class would undoubtedly enlist if they saw a reasonable prospect of obtaining employment on the termination of their military career. It is this uncertainty which at present prevents the enlistment of the educated man.

As already stated, the Army Council have caused Committees to assemble in each command to consider the possibility of better qualifying the soldier while in military service for his return to civil life by enabling him to learn a trade. The Special Army Order, issued in September last substituting proficiency pay for Service pay, and making the grant of the former, among other things, depend upon the possession of a third-class school certificate, is another step in the same direction, and shows that the Army Council are using every endeavour to fit the soldier for employment on his return to civil life. These efforts, however, cannot fully succeed unless the Government of the country is prepared on its part to assume its share of responsibility, and to ensure that, as far as possible, ex-soldiers and ex-sailors are given the choice of those appointments under it in civil life for which they are fitted.

Military Statistics.

The second section of the Report consists of thirteen parts as follows :

1. Establishment and strength of the Regular Forces, Army Reserve, and Auxiliary Forces on 1st October, 1906.
2. Strength and distribution.
3. Recruiting and casualties.
4. Re-engagements, extensions, pensions, and desertions.
5. Reliefs and reinforcements.
6. Punishments and rewards.
7. Services and ages.
8. Nationality, religion, and education.
9. Horses and mules.
10. Army Reserve.
11. Militia.
12. Imperial Yeomanry.
13. Volunteers.

On 1st October last the establishment of Regulars, Army Reserve, Militia (United Kingdom), Militia (Reserve Division), Militia (Channel Islands, Malta, and Bermuda), Imperial Yeomanry, the Honourable Artillery Company, Volunteers (Great Britain), and Volunteers (Bermuda) made altogether a general total of all ranks of 907,216, while the strength was 764,561. The Volunteers in Great Britain were: Enlistment, 338,452; strength, 257,918.

An Austrian Opinion of the French Manœuvres of 1906. — Infantry.—In the offensive, the roads are left in order to march in close formation at a distance of from 4 to 5 kilometres from the enemy. Up

France. to about 1,000 paces from the latter the infantry advances rapidly in sections at an easy pace, then the two centre sections of each company form into a line of skirmishers in groups of two together and open fire. The squad commander names the man to fire and the number of rounds to be fired; the two men of the group fire alternately, and the man not firing observes. From 1,000 paces the deployed swarms advance in rushes, of from 30 to 40 paces only, by alternative sections. The object of the reinforcements to the skirmishing line is not so much to bring an increase of fire power as to get to the assault as quickly as possible, and the latter is sometimes commenced even from 300 to 400 paces from the enemy. Under these conditions the lack of deployment of infantry fire power must be replaced by artillery, and when possible by that of machine guns as well. The intelligent co-operation of the three arms in the offensive is worthy of very special notice.

In the defensive, advanced positions are frequently made use of to force the enemy to deploy prematurely and wrongly. Fire is opened, in this case too, when the enemy is at a maximum distance of 1,000 paces. The fire is very deliberate and the firer seems to enjoy more liberty of action than in the offensive. The principal reserve here always serve for the counter offensive, but the latter is most frequently carried out from the front, by leaving the position, and with the bayonet.

The training of the infantry is on the whole, excellent, and the men are very hardy, and this was particularly noticeable in the 4th Infantry Division, brought up to war strength by its reservists. In spite of the length of the marches, the great heat, and the undoubtedly too great weight carried, there were no stragglers. It is surprising that in spite of the thorough training of the French infantry, reconnoitring duty during action by means of infantry patrols receives but little attention, although the intelligence and zeal of the French infantryman furnish the best preparatory conditions for that branch of instruction.

Cavalry.—In France, too, the cavalry is employed almost exclusively as a battle-arm; dismounted action is seldom resorted to; scouting is often non-existent. The men ride well. The type of horses is greatly improved, and the horses were in excellent condition. Long gallops with loose reins are the rule; work at the trot was less satisfactory.

Artillery.—The artillery merits unbounded praise. The officer is thoroughly trained, from a tactical point of view, and rides well. The men are particularly intelligent, the horses very good, the Q.F. gun very mobile and acts well from a technical point of view. The batteries advance, as a rule, by brigade divisions, completely covered, up to 30 or 50 paces behind the covering crest, and take up position. Long lines of artillery are no longer seen, as in previous years, and the distribution of batteries by brigade divisions has greatly facilitated mobility from a fighting aspect.

In the offensive, less attention is paid to fighting the hostile artillery than to supporting its own infantry. With this object a portion of the batteries (provided with shields) accompany their infantry into the enemy's zone of infantry fire. In the defensive, too, a similar employment of the artillery is to be noted. On evacuating positions, or when retreating, about half the artillery remain in position until the enemy has come up to from 500 to 600 paces, and during that time the other batteries occupy the positions situated more in rear.—*Streffleurs Militärische Zeitschrift* and *La France Militaire*.

French and German Tactics.—An essential part of a comparative study of the French and German Armies consists of an elucidation of the tactics adopted respectively by them, the profound divergencies of which are succinctly demonstrated in Major Driant's latest work entitled "*Vers un nouveau Sedan.*"

At the opening of hostilities the French put in action so-called mixed detachments composed of infantry, cavalry, and artillery. It is expected that these detachments, when commanded by superior officers or generals possessed of the particular qualities of acumen and decision, will serve to deceive the enemy as to the distribution of the forces before him, to oblige him to deploy prematurely, to disquiet his flanks, and by successive assaults upon his whole front to procure valuable intelligence.

The Germans place no value on these detachments because of their lack of mobility, being hampered as they are to the slow motion of the infantry. They rely for the stated purposes solely upon their cavalry, which is numerous, trained to fighting on foot, and furnished with machine guns. Dismounted cuirassiers may be all deployed with machine guns, lying flat on the ground and holding a position which they had been able to occupy before the enemy, sufficiently long to compel the latter to make a regular attack.

During the action the French infantry seeks to advance carefully from one cover to another, to utilise all hidden conduits leading towards the enemy, to accumulate in the same great masses of troops, thence to be sent forth in their proper direction.

The Germans utilise covers only when found immediately within their range; they never deviate from the straight course to look for shelter. With them everything is sacrificed to the direction which is being observed remarkably, and to the object which will never be lost sight of. In open territory the French system of breaking into small columns in order to escape losses is now adopted by the Germans, who frequently advance in long and compact chains of skirmishers, following each other very closely at distances of not more than fifty or one hundred yards.

But it is in the final combat, at the decisive hour, that the conceptions of solving the problem differs most radically in the two Armies. Both methods have for several years been hotly discussed without reaching conclusions convincing either of the disputants. Unquestionably, the truth lies between the two opinions. Situations will occur when the Germans will be obliged to employ French tactics in order to compel victory, and *vice versa*; for in war nothing is absolute.

In France this axiom prevails: The firing is only the means, the forward movement the end. It follows that victory can be attained only by the final effort of a shock. Without this specifically Napoleonic offensive mode there is no decisive result. All that precedes: more or less strained fighting at the front, assaults at the flanks, artillery duels—all these simply constitute the preparation for discovering the weak point. This point, once found, the commander has to throw against it a large body of fresh troops not yet unnerved by the excitement of the fight. This point carried, the resisting power of the enemy is broken, the battle is won.

The Germans, on the other hand, say: The firing is all; therefore, find the main position of the enemy, deluge it with your superior fire, and it will tumble by itself without requiring on your part the effort of a costly encounter. Should it, nevertheless, resist, manœuvre, outflank, or envelop it, and as soon as the defenders hear your cannon in their rear, you are the winning party. Such were the Japanese tactics at

France and Germany. Liao-Yang and at Mukden, tactics they had been taught by German instructors.

The Germans place the highest confidence in the superiority of their fire—artillery fire as well as infantry fire—although they acknowledge the great value of the French cannon at rapid firing. Notably, as to the marksmanship of their infantry, they claim that no soldier in Europe comes up to their standard, and this is no bluff. Take, for instance, one of those cases of sentinel attacks so frequent at the frontier. Invariably you will notice this: In Germany the aggressor is killed on the spot, or at least hit; in France he most always escapes without a scratch. —*U.S. Army and Navy Journal.*

Germany. *Army Remount in 1906.*—The *Militär-Wochenblatt* of the 9th March last published an interesting account of the operations of the remount service for the whole of the German Army during the year 1906, of which the following is a summary:—

1. *Prussia.*—The various States or provinces are classified according to the importance of the contingent of horses purchased.

	Shown.	Purchased.
East Prussia	11,476	6,378
Hanover	2,572	1,143
Mecklenburg	2,175	871
Posen	1,853	747
West Prussia	1,492	481
Schleswig-Holstein	1,611	423
Pomerania	400	188
Brandenburg	450	154
Silesia	260	121
Oldenburg	292	73
Hamburg	106	56
Rhine Province	168	27
Lubreck (free town)	54	23
" (principality)	32	14
Brunswick	13	5
Total	22,954	10,704

These results, compared with those obtained in 1905, demonstrate that in that year out of the 23,823 horses shown, only 10,714, or 45 per cent., were purchased, whereas in 1906 the percentage of horses purchased to those shown was 47 per cent. In 1906 the average price of horses was about £48 10s. a head, or an increase of £1 10s. on 1905.

At first sight it would appear that Hanover furnishes a very small number of horses, which might lead one to suppose that horse-breeding there was on the decline. That is, however, not the fact, for it is essentially a horse-breeding country. As, however, the breeders there sell their colts before they are three years old (the age for remounts), it follows that the best ones are distributed among the neighbouring provinces, where many of them are shown to the Purchase Commission. It is calculated that 2,000 Hanoverian horses are taken annually for Army remounts. The small number of horses furnished by the provinces of Schleswig-Holstein and Oldenburg is the result of their preferentially breeding very large, stout, cross-bred horses, only a small number of which are suitable for artillery

draught. The Grand Duchies of Hesse-Nassau, Baden, and Alsace-Lorraine no longer furnish remount animals, the Purchase Commission only applying to provinces where thoroughbred stallions are used as sires. **Germany.**

2. *Bavaria.*—The Remount Commission of the Bavarian Army purchased 1,518 horses, furnished by the following provinces :—

	Shown.	Purchased.
Bavaria	634	378
East Prussia	1,118	938
Holstein	70	50
Hamburg	171	152
Total	1,993	1,518

Or 76 per cent. of the horses shown.

The proportion of horses furnished to the Bavarian contingent by Bavaria itself is only 27 per cent. That proportion is 59 per cent. from Prussia and 14 per cent. from Holstein. The average price for horses is £48. Horse-breeding is progressing in Bavaria, for the respective proportion of animals purchased in 1905 were: Bavaria, 23 per cent.; Prussia, 65 per cent.; and Holstein, 12 per cent.

3. *Saxony.*—The Saxon Remount Commission purchased 959 horses out of the 1,441 which were shown them, or a proportion of 66 per cent. The average price of horses was £48. The "made" horses purchased for artillery draught cost on an average £65 apiece. The horses for the Saxon contingent came from :—

Saxony	78
East Prussia	775
West Prussia	10
Hanover	27
Holstein	63
Schleswig	6
Total	959

4. *Württemberg.*—93 horses were purchased in the county itself and 159 in North Germany, or a total of 252 out of 431 shown, or 59 per cent. In addition, Württemberg received 261 horses drawn from the Prussian remount depôts, for, as is known, only one such depôt exists in Württemberg, and that only to take horses for field artillery purchased on the spot.

Altogether the German Army purchased in 1906, 13,433 horses out of 26,819 shown, or a proportion of 50 per cent.

SWITZERLAND.—*Manœuvres in 1907.*—The general programme of the manœuvres contains some innovations. Last year, in his general criticism of the manœuvres of the IVth Army Corps, Colonel Techtermann laid stress on the inconvenience caused by the insufficient effectives of the so-called "Manœuvrer" Division, opposed, during these later years, to the Army Corps. The commander of that division, already too limited with regard to the means at his disposal, found himself also similarly restricted with regard to the choice of his combinations. The direction of the man- **Switzer-land.**

Switzerland.

œuvres was also tied down with regard to the organisation of the exercises. Colonel Techtermann expressed a wish that the manœuvre division should be reinforced.

This wish has been acceded to. This year the manœuvre division will be considerably strengthened. It will consist of the 5th and 10th Brigades and a third combined brigade of 5 battalions, viz., of the 11th Regiment and of the 3rd and 5th Battalions of Carabiniers. The increase will also extend to the artillery, which will be 2 regiments strong (instead of 1) or 12 batteries. Finally, the cavalry will be that of the 3rd Regiment and of the 4th Brigade, with the 2nd, 3rd, and 4th Machine Gun Companies. There will also be this year a change from the cavalry manœuvres which took place in 1905 and 1906. The cavalry of the manœuvre division will be formed under conditions approaching reality, and will have a wide field for its actions.

Briefly, the 1st Army Corps, consisting of 26 battalions, 8 squadrons, 1 machine gun company, and 18 batteries, will be opposed by a reinforced division of 17 battalions, 9 squadrons, 3 machine gun companies, and 12 batteries. The manœuvres should thus afford greater interest, and the chief command should derive more benefit from them.

In the same way, as a change is introduced with regard to the cavalry manœuvres, another change affects those of field fortified positions. They will no longer this year be organised independently of the troops called to the grand manœuvres, but will be included in the programme of exercises laid down for those troops. It will be those of the 1st Division, and the terrain will, no doubt, be the neighbourhood of Pomy.

The 9th Infantry Brigade will from the 26th to the 28th September carry out exercises of regiment against regiment, with the usual special troops and departments attached. The cavalry will be the 5th Dragoon Regiment, whilst the 6th and 7th Regiments will provide the squadrons for the regimental and brigade exercises of the 1st and 2nd Divisions. The Guides companies, 3rd to 8th and 11th and 12th, will manœuvre independently in brigade, and then as a regiment against regiment. As artillery, the 9th Infantry Brigade will receive the batteries of a brigade division. Finally, the 12th Infantry Regiment will manœuvre from the 10th to the 21st September against the troops of the St. Maurice garrison.

SWITZERLAND.—*Instructions to Umpires at Manœuvres.*—The following is the text of the instructions given to umpires on the occasion of the manœuvres of the IVth Army Corps in 1906:—

The duties of umpires at manœuvres, difficult and requiring great tact, are, as a rule, badly understood, alike by the officers charged with them and by the troops.

This service requires, above all, from umpires a sound tactical comprehension of all situations of a battle, great mobility, and a faculty for rapid decision. From the troops it should be required that they conform, without restriction and without hesitation, to the umpires' rulings. Umpires' decisions take the place, in peace manœuvres, of the actual events and chances of war. The manner in which these decisions are arrived at has no essential value further than the proportion of the forces engaged on both sides, and the position in which they find themselves should be taken into account. In war all these factors may incline very favourably to one of the sides, and at the same time, from some accident impossible to foresee, that side may sustain a reverse.

On the other hand, it is of importance that all umpires' decisions, creating fresh situations, should be at once carried out without recrimination and without delay. A rapid adaptability to new circumstances is very useful for the instruction of the men as regards war, which is the final object of peace manœuvres. As regards rapid decisions, the umpires should, in the first place, take into account the results of a proper conduct of fire (surprise, proper range, good sighting, nature of fire, corresponding with objective, appropriate formations).

Switzer-
land

The following rules specially apply to the duties of umpires:—

1. Umpires are attached to the various units for the whole period of the manœuvres; therefore those units find the lodging, the baggage transport, the forage, and finally the food of the umpires.
2. Umpires should refrain from all intervention in the tactical disposition of the parties. They communicate all their observations to the Umpire-in-Chief before the critique. Their duties commence before the advance (taking up of artillery positions), and umpires are entitled to order other formations to be adopted when they observe those already taken to be unsuitable to the ground and to the enemy's fire.
3. All umpires should strictly enforce that their decisions are respected and promptly carried out. All objections to an umpire's decision are inadmissible. Officers who do not at once obey the umpires' rulings will be at once replaced in their command by their subordinate, and the matter reported at the critique.
4. In the interests of the instruction of troops, putting a company out of action should be avoided as far as possible. The cases when this method is unavoidable will be mentioned at the critique. When troops are placed out of action they will pass to the reserve. In most cases it will suffice to suspend action for a time to re-establish order and to give the impression of losses which would have taken place in reality.
5. Umpires should especially and most carefully watch that the action of the enemy's fire, particularly that of the artillery, should everywhere be taken into consideration. In doubtful cases they will decide to which unit the indications given by flags relative to the fire of the hostile artillery should apply.
6. Umpires should direct special attention to the service of security (outposts, etc.). They must remain uninterruptedly within reach of the units charged with this duty, make them correct errors committed, and send in a special report on the subject.
7. They must also be careful that the resumption or the breaking off of an action is carried out properly, and that the troops protect themselves until the outposts have been placed. They must remain on the ground up to that moment.
8. Before the critique the umpires will assemble and communicate their observations to the Umpire-in-Chief of each side. These latter will submit the information received to the Chief Umpire with their own observations.
9. Every day, on the conclusion of the manœuvres, the umpires will send in a chronological report on what they have done, and these reports will form the basis of a final report to be drawn up.
10. Divisional Commanders or the highest in rank of the umpires attached to a side are responsible for the distribution of the umpires under their orders for the entire period of the manœuvres. On emergency they may modify this distribution. For their part they must not content themselves by merely personally following the staffs to which they are

Switzerland. attached. They must also intervene when necessary, and give their decision. They will receive all the reports of the umpires under their orders.—*Revue Militaire Suisse* and *Schweizerische Monatschrift für Offiziere aller Waffen*.

United States.

Rifle Practice in Public Schools.—At the annual meeting of the National Board for the Promotion of Rifle Practice, held in Washington on the 24th January, 1906, a special committee was appointed to inquire into and report at the next annual meeting of the Board upon the feasibility and advisability of some policy to inaugurate a system of rifle practice throughout the public schools of the country. At the last meeting of the Board held at Washington, D.C., on the 25th January, 1907, the report of this committee was submitted, and is published in accordance with a resolution adopted by the Board and approved by the Assistant Secretary of War, President of the Board.

The report of this special committee is a document of great interest to all who favour a general system of training in marksmanship for American youth. It points out that, while many unsuccessful attempts have been made to institute a course in rifle practice in the public schools of the country, such a course has been established in the schools of the city of New York, and that the success which has been attained there has demonstrated the feasibility and advisability of introducing rifle practice in the public schools among the boys over the age of thirteen years. The system in vogue in the schools of New York was devised by the Public Schools Athletic League, and has been so thoroughly tested that, in the opinion of the special committee, it should be recommended for adoption.

The public school system of the city of New York is of enormous proportions. It includes three training schools, nineteen high schools, 490 elementary schools, two truant schools, and one nautical school; total, 515, with 14,500 teachers. These schools are scattered all over the 326 square miles which the city covers. The registered number of pupils enrolled in these schools is about 600,000, which is more than the entire population of St. Louis, the fourth city in the Union. Half of them are boys. The number attending the high schools is about 20,000, a little more than half of whom are boys. The College of the City of New York has about 4,000 male students. The Public Schools Athletic League, organised on the 4th December, 1903, to promote wholesome athletic exercises among the pupils of the New York schools, reports that during the year 1906 the games carried on under its direction numbered more than 600, in which there were more than 150,000 entries. Early in 1905 the League decided to institute rifle practice among the boys of the high schools of the city, which schools are attended by boys from fourteen to nineteen years of age, by installing in as many of the high schools as possible a "sub-target gun machine." This is an ingenious apparatus, by which an ordinary Krag Army rifle is attached to a rod upon an upright standard, placed to the right of the firer, in such a way that while the gun is movable, the rod follows the movements of the barrel of the rifle, and is at all times parallel with the line of the sights.

The shooter cocks the rifle and aims at a target a foot high on the other side of the room, and when his aim is satisfactory, pulls the trigger. When this is done an electrical connection is made which shoots forward the rod which is on the standard, so that its point punches a hole in a miniature target like a visiting card, which is placed in front of it, which hole is mathematically on the same relative place on the card target as would have been made in the target at which the shooter was aiming if

he had a bullet in his rifle. It consequently gives the same experience in holding and "pull off" as is had in actual shooting.

The machine possesses the additional advantage that the instructor standing on one side of the shooter can see by the movements of the point of the rod on the miniature target exactly how the aim is being taken on the large target, and is able to correct all errors in holding and pulling off as they are made—something which has hitherto been supposed to be impossible. The apparatus makes no noise; there is no danger of its hurting anybody. It can be used very rapidly, and there is no expense involved in its operation. The results obtained from its use are so valuable that several of the New York National Guard Regiments consider the machine equal in value to their rifle galleries.

Through the kindness of several public-spirited citizens, one of these machines, costing 265 dollars, was presented to each of ten high schools. A "marksmanship committee" was chosen, consisting of the coaches of the schools having gun machines, and under the direction of this committee various matches have been held. Gradually all the high schools were provided with gun machines. The League established a marksmanship badge, to be awarded, as in the National Guard and in the Army, to each boy who annually showed satisfactory proficiency in shooting. It found almost immediately that the boys were shooting so well that it was necessary to raise the standard from forty out of a possible fifty "off-hand" to forty-two, and later to forty-three. During the year, 197 boys in ten schools qualified as marksmen, and those results justified the raising of the qualifying score to forty-four.

After detailing the results of various matches and tournaments conducted under the auspices of the League, the report of the special committee goes on to say that at the present time there are over 7,000 young men being instructed in these high schools in shooting with a military rifle, the gun used being the regular Krag Army rifle as issued by the War Department. Great interest in the matter has been taken by both teachers and boys. Many of these have now become so proficient that the services of a paid instructor have been dispensed with. It is believed that if a young and active Regular officer could be detailed to act in this capacity, he would be of the greatest service, and could, besides helping the shooting, give the boys some idea of military movements and discipline, which would be of great value.

The League is now preparing a manual of instruction to be used in the different schools. In addition to containing instructions for the use of the sub-target gun machine, it will give a general idea of what is necessary to know in order to shoot accurately. Those who have had charge of the instruction of these boys are unanimous in the opinion that they acquire knowledge of rifle shooting in about one-quarter of the time that is found necessary in the case of grown men. If the young men who are graduating from our high schools in the different States should be skilled riflemen, the country can rest content with a small standing Army.

"The system, therefore," says the report in conclusion, "is a great factor for national peace. The committee would therefore recommend: (1) That the largest possible publicity should be given to the methods that have been found to be so successful in the New York high schools; (2) that the educational officials of the different States should be urged to introduce instruction in rifle shooting in their schools among the boys of thirteen years of age and upwards, conforming to the New York methods as far as their situation will permit; (3) that this would be helped by the organisation of a Public Schools Athletic League in each educational centre."—*U.S. Army and Navy Journal*.

NAVAL AND MILITARY CALENDAR.

APRIL, 1907.

- 2nd (T.) H.M.S. "Hermione" completed for sea service on Cape Station.
H.M.S. "Diadem" arrived at Plymouth from China.
- 5th (F.) H.R.H. The Duke of Connaught presented new Colours to the 1st
Bn. Royal Dublin Fusiliers at Alexandria, Egypt.
- 11th (Th.) H.M.S. "Diadem" paid off at Chatham.
- 12th (F.) H.M.S. "Diadem" re-commissioned at Chatham for Home Fleet.
- 13th (Sat.) Launch of First-class Armoured Cruiser "Invincible" from Elswick
Yard, Newcastle-on-Tyne.
- 15th (M.) Launch of First-class Battle-ship "Aki" from Imperial Japanese
Dockyard, Kure.
- " " Announced that Lord Kitchener's appointment as Commander-in-
Chief, in India, had been extended 2 years.
- 27th (Sat.) Launch of First-class Armoured Cruiser "Defence" at Pembroke.
-

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval*. Buenos Aires :
January and February, 1907.—"Centenary of Colonel Juan B. Thorne."
"The Japanese Explosive (Shimose) in use for their Shells." "A Re-
sumé of the Practical Instructions of Captain A. Cooper in order to foretell
with Probability the State of the Weather." "The Argentine Mercantile
Marine." "The Maritime Canal from Buenos Aires to the Parana de Las
Palmas." "The Naval Hospital." "The Solution of a Summary."
"Armoured River Gun-boats." "Submersible Boats." "Armour and
Ships" (concluded). "Refrigerating Installations on board Ships" (con-
cluded). "Excavation in the Outer Port of the Harbour."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens*.
No. 5. Pola : May, 1907.—"The Organisation of a Modern Battle Fleet."
"On the Sanitary Arrangements in the Japanese Navy, and the Lessons
of the War in 1904-1905." "The Italian Naval Estimates for the year
1907-08." "The Prize Firing in the English Fleet for 1906."

BRAZIL.—*Revista Maritima Brasileira*. Rio de Janeiro : December,
1906.—"A Uniform Spirit in the Direction of Naval Affairs." "Naval
Strategy." "Evolution and Tactics of Artillery and Landing Opera-
tions (continued)." "The fittings of a Gun" (continued). "Defence of

Coasts and Harbours" (concluded). "War and Law" (continued). "The Fishing Industry" (continued). "The Instruction of Artillery Personnel" (concluded). "The Bay and Bar of Tutoya" (concluded).

January, 1907.—"Voyages of Instruction." "The Evolution and Tactics of Artillery and Landing Operations" (continued). "The Municipalities and the Navy." "Naval Strategy" (continued). "The Fishing Industry" (continued).

FRANCE.—*Revue Maritime*. Paris: March, 1907.—"On Friction, Lubrication, and Lubricants" (concluded). "Mines and Turbines." "The Battle of Tsushima." "Pumping-out Appliances in Ships of War." "The Nauen Station and Wireless Telegraphy."

La Marine Française. Paris: April, 1907.—"The Black Series." "The Influence of Submarines on the Naval Policy of the Various Powers." "Open Letter to M. Declassé, President of the Commission of Enquiry on the Navy." "Cherbourg and Naval Defence." "The Navy in Parliament: The "Jéna" Catastrophe."

La Vie Maritime. Paris: March, 1907.—Has not yet been received.

Le Yacht. Paris: 6th April, 1907.—"The Dockyard Workmen." "Yachting Notes." "A New Commission of Enquiry on the "Jéna." "The New German Submarine." 13th April.—"The Rank of Corvette-Captain." "Yachting Notes." "The Armoured Cruisers "Suffolk" and "Lancaster." 20th April.—"Submarine Mines." "Yachting Notes." "The New Transatlantic Giants, "Lusitania" and "Mauretania." "The Italian Submersible "Glaucos." "The Japanese First-class Armoured Cruiser "Tsukuba." "A propos of the "Jéna" Enquiry." 27th April.—"Why the French Flag has Lost Ground in Tunisia." "Yachting Notes." "The Italian Battle-ships of the "Vittorio Emanuele" Type." "The Influence of the Machinery on the Armaments of Modern War-ships."

Le Moniteur de la Flotte. Paris: 6th April, 1907.—"The Rank of Corvette-Captain: Its Use." "The Navy in Parliament: The "Jéna" Catastrophe." 13th April.—"Questions of Pay." "The "Jéna" Catastrophe." "The Loss of the "Jean Bart." 20th April.—"The Apparatus for Weighing Anchors." "The Loss of the "Jean Bart" (continued). "Commissions of Enquiry." "The Naval Exhibition of Bordeaux." 27th April.—"The Material for Salvage of Ships." "Winners in the Prize Firing for the Fleet in 1906." "The Commission of Enquiry in the Chamber." "The Navy in Parliament."

GERMANY.—*Marine Rundschau*. Berlin: April, 1907.—"Trafalgar and Tsushima." "Modern Seamanship and Technique." "The Legacy of a German Naval War Teacher." "The English Naval Estimates, 1907-08." "The Report of the English Admiralty on the Manœuvres, 1906." "Annual Report of the Secretary of the U.S. Navy, 1905-06."

ITALY.—*Rivista Marittima*. Rome: February, March, 1907.—Have not yet been received.

PORTUGAL.—*Revista Portuguesa, Colonial e Marítima*. Lisbon: March, 1907.—"Geographical Nomenclature of the African Coasts" (concluded). "A Colonial Tax." "The Colonial Movement."

Annaes do Club Militar Naval. Lisbon: February, 1907.—Has not yet been received.

SPAIN. — *Revista General de Marina.* Madrid: March, 1907. — "Trafalgar and the Spanish Navy." "Sanitary Condition of the English Navy." "Lessons?" (continued). "Something on Reorganisation." "Effective Patriotism." "On the New Battle-ships." "The Seismic Movement and the Internal State of the Globe." "The Wireless Telegraphy Conference at Berlin, 1906" (concluded). "The Catastrophe at Toulon."

MILITARY.

ARGENTINE REPUBLIC.—*Revista Militar.* Buenos Aires: February, 1907.—Has not yet been received.

AUSTRIA-HUNGARY.—*Danzer's Armee-Zeitung.* Vienna: 4th April, 1907.—"The People's Awakening." "Some Thoughts on the Simplification of the Economic Administration Service." "A new Italian Torpedo-boat Station in the Adriatic." "Military Evening Discussions." 11th April.—"The 8-cm. Field Gun, M.5." "The English Admiralty and the Disarmament Question." "Two Military Historical Examples of the Transmission of Important Orders." "The Dress of our Reserve Officers." 18th April.—"Carl Baron Torresani." "Necessity for Reform of the General Staff." "The Role of Individuality in War." "Company Training during the Summer." "One-year Volunteers." "From the American Artillery." 25th April.—"Friedrich, Freiherr von Fisher." "The New General Staff Course." "The Role of Individuality in War" (continued). "Medical Statistical Report of the Austro-Hungarian Army for 1905." "Illiteracy in the Italian Army."

Streffleurs Militarische Zeitschrift. Vienna: April, 1907.—"The Campaign of Tsaszeg, 1849." "The Efficiency of the Army School for Musketry at Bruck." "The New German Field Fortifications Regulations." "The Russo-Japanese War" (continued). "Progress in Foreign Armies in 1906." "Intelligence from Foreign Armies." "Naval Intelligence."

Mittheilungen über Gegenstände des Artillerie- und Genie Wesens. Vienna: April, 1907.—"Machine Guns." "The Great Nauen Wireless Telegraph Station near Berlin." "The Draft of the German Field Fortification Regulation." "The Rexer Machine Gun." "On the Calculation of Differences of Calibre."

Die Militärische Welt. Paris: April, 1907.—"A German Arms Factory." "Intelligence regarding Wireless Telegraphy and Telephones, with Special Regard to the Colossal Station Nauen." "Belcredi." "The Way to the Berlin Congress." "The Armies of the Balkan States." "Sergeant-Major Victor Nagy." "The Report of a Special Reporter for the Year 1870." "Military Motor World." "A new French War Motor." "Military Motoring in Austria." "The Aeronautic World." "The Compensation Conference."

Kavalleristische Monatshefte. Vienna: April, 1907.—"What Lessons may be Learnt from the War in the Far East as regards the Employment of Cavalry?" "Viribus Unitis! Considerations of the German and Austro-Hungarian Cavalry and their Relation to one another." "Horse.

Artillery in Combination with Large Bodies of Cavalry." "Increased Demands on Cavalry." "The War Horse." "Horse Breeding and Remount." "Harnessing and Regimental Transport."

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires.* Brussels: 15th April, 1907.—"The French War Budget for 1906" (concluded). "The Russo-Japanese War" (continued). "The Training of Infantry with a View to Offensive Action" (continued). 30th April.—Has not been received.

FRANCE.—*Revue du Cercle Militaire.* Paris: 6th April, 1907.—"The Delimitation of the Franco-German Frontier and Colonel Laussedat." "Permanent Fortification" (continued). "Dusty Papers" (continued). 13th April.—"Organisation of the Infantry Officer." "Dusty Papers" (continued). "Permanent Fortification" (continued). 20th April.—"Permanent Fortification" (continued). "Dusty Papers" (continued). "Organisation of the Infantry Officer" (continued). "The Army at the *Concours Hippique*." 27th April.—"The Commencement of the War of 1870-71." "Organisation of the Infantry Officer" (continued). "Permanent Fortification" (concluded).

Revue d'Histoire. Paris: April, 1907.—"The Campaign of 1794 with the Army of the North" (continued). "The Campaign of 1805 in Germany" (continued). "The Campaign of 1870-71" (continued).

Le Spectateur Militaire. Paris: 1st April, 1907.—"The Grand Autumn Manœuvres in 1906" (continued). "Cavalry in the Russo-Japanese War and in the Future" (concluded). "Essay on Colonial Defence" (concluded). 15th April.—"The Grand Autumn Manœuvres in 1906" (continued). "The Swiss Army: Cavalry." "Method of Instruction in Field Service in Squadrons." "Yellow versus White" (concluded).

La Revue d'Infanterie. Paris: April, 1907.—"German Infantry Drill Regulations of 1812, 1847, 1888, and 1906." "Field Glasses." "Mission of the Olympic Games, 1906." "Reflections on the Manchurian War" (continued). "Africa and the Crimea—1850-1856" (continued).

Revue de Cavalerie. Paris: April, 1907.—"The Cavalry and its Detractors." "The Regiments of the Margueritte Division and the Charges at Sedan" (continued). "Field Service in the German Cavalry." "Light Cavalry in France at the End of the Old Régime." "The New Cross-Country Soldiers."

Revue du Service de l'Intendance Militaire. Paris: February, 1907.—"The Japanese Army and its Administrative Services." "Survival of Pathological Baccilli in Bread after Baking." "Notes on the Sugar Industry."

March, 1907.—"Phosphorus and Sulphur of Foods." "On the Preservation and Putrefaction of Meat" (concluded). "Notes on the Sugar Industry" (concluded).

April, 1907.—Has not been received.

Revue Militaire des Armées Etrangères. Paris: April, 1907.—"The German Imperial Manœuvres in 1906" (concluded). "Military Automobilism in Italy." "The Siege of Port Arthur" (continued).

Revue Militaire Général. Paris: January, 1907.—"The Object of the *Revue*." "The Principle of the Combination of Arms, and the Russo-

Japanese War." "French and German Tendencies regarding the Preparation for and the Execution of the Battle." "Old Campaigns: An Episode of the Wars of Louis XIVth." "Spicheren, 6th August, 1870." "War Game and Map Manœuvres."

February, 1907.—"An Episode of the Battle of Mukden." "Studies of the Russo-Japanese War: Responsibilities and Causes of Defeat." "Contribution to Musketry Exercises in the Open Country." "Spicheren, 6th August, 1870" (continued).

March, 1907.—"Studies of the Russo-Japanese War: The Inkow Raid, 8th-17th January, 1905." "Contribution to Musketry Exercises in the Open Country" (concluded). "Spicheren, 6th August, 1870" (continued). "A Manœuvre on the Map." "Notes on Foreign Armies."

April, 1907.—Has not been received.

Journal des Sciences Militaires. Paris: April, 1907.—"Si nice Res: The Awakening of Asia and Imperialism." "Study of Tactics" (concluded). "Questions of Artillery Tactics." "Modern Organisation of the Staff in Army Corps." "Soldiers of the Revolution" (continued). "Rôle of the Officer in Matters of Hygiene."

Revue du Genie Militaire. Paris: April, 1907.—"Defensive Organisation of the North-Eastern Section of Port Arthur in 1904." "Military Photographic Reconnaissance by Land, Sea, and Balloon" (continued).

GERMANY.—*Militär-Wochenblatt.* Berlin: 4th April, 1907.—"School Horses." "Intelligence of the Austro-Hungarian Forces." 6th April.—"Battle Pictures and South-West Africa." "Löbell's Annual Report for 1906." 9th April.—"Fire and Cover in Action." "Long Distance Rides in the German and French Armies." "Löbell's Annual Report for 1906" (concluded). 11th April.—"Tactical Studies from the Russo-Japanese War, 1904 to 1905." "On Reconnoitring Missions by Patrols." 13th April.—"A Russian Officer on the German Manœuvres." "How should we Practise the Infantry Attack over Open Plains?" "Cavalry Impressions from the English Hunting Field." 16th April.—"Infantry Drill Regulations." "A Swiss Opinion on Anti-Militarism." "Intelligence from the Russian Army." 18th April.—"The Effect of Hostile Fire in the Battle-Training of the Battalion." "Group Shooting of Austrian Infantry at Benatek." 20th April.—"Field Artillery in the Infantry Drill Regulations of 1906." "On Practical and Unpractical Abridgements." "The Equipment of Infantry and Cavalry Officers with Prismatic Glasses." 23rd April.—"Two Cavalry Replies." "On the Arrangement of Field Artillery Manœuvres." "From the Netherlands Army." 25th April.—"On the Question of Battle Formations." "Roumanian Fortifications." 27th April.—"Fortieth Year's Regimental Jubilee of H.R.H. Prince Ludwig of Bavaria." "The Value of the Successful Frontal Attack and High-Angle Fire in the Field." "Intelligence from the French Army." 30th April.—"Service Jubilees." "The Value of the Successful Frontal Attack and High-Angle Fire in the Field" (concluded). "The Modern Chinese Army."

Internationale Revue über die gesamten Armeen und Flotten. Dresden: April, 1907.—"Military and Naval Intelligence from Argentina, Austria-Hungary, Belgium, China, Denmark, France, Germany, Great Britain, Italy, Japan, Russia, and Switzerland." Supplement 85.—"Japanese Armaments." French Supplement 97.—"Lessons of the Russo-Japanese Naval War, from an Artillery Point of View." "Extent of Front of Modern Battle." "The Affair of the Servian Field Guns."

"The Battles of Karrasberg." "Chilian Military Organisation and Manœuvres." "The Field Gun of the Future." "The Channel Tunnel." "The Artillery as Battle Reserve." "The Battle of St. Privat: New View by the German Staff." "The Military Training of the German Soldier."

Jahrbücher für die Deutsche Armee und Marine. Berlin: April, 1907.—"Machine Guns and their Employment." "The Problem of the Employment of Cavalry in the Manchurian Campaign." "Clothing and Equipment." "Bayonet Fighting in the German Infantry." "General Kuropatkin's Work on the Russo-Japanese War."

Artilleristische Monatshefte. Berlin: April, 1907. — "Theory of Barrel-Recoiling Guns" (continued). "On the Increase of the French Field Artillery." "Criticism on the Organisation of the German and French Field Artillery." "Critical Supplements to the Article, 'The Development of the Barrel-Recoiling Field Howitzer.'" "Spring Wheels for Artillery Matériel Transport." "Artillery Matters from the Naval Pocket Book."

Neue Militärische Blätter. Berlin: March, 1907. No. 13.—"On the Reform of the English Auxiliary Forces." "Napoleon's Strategy in the Light of Modern Military Criticism" (continued). "Personnel of the United States Navy" (concluded). "War Balloons and the Hague Conference." "Theory and Practice." "Military Intelligence." No. 14.—"Commercial Policy and the Strategic Importance of the Hawaii Islands." "Napoleon's Strategy in the Light of Modern Military Criticism" (continued). "On the Subsistence, Health Precautions, and Clothing of Troops and Travellers in the Tropics." "Military Foreign Outlook." "Spiritual Work in the Army." "A new Military Medical Regulation." "Military Intelligence."

April, 1907. No. 15.—"Hans Karl von Winterfeldt." "On the Prospects of a Japanese-American War." "Military Foreign Outlook" (concluded). "Napoleon's Strategy in the Light of Modern Military Criticism" (concluded). "On the Subsistence, Health Precautions, and Clothing of Troops and Travellers in the Tropics" (continued). "The New Austro-Hungarian Field Gun." "Military Intelligence." No. 16.—"The Occupation of Ujda by the French." "The British Colonial Conference and Imperial Defence." "Hans Karl von Winterfeldt." "On the Subsistence, Health Precautions, and Clothing of Troops and Travellers in the Tropics" (continued). "What is Necessary for the German Artillery." "Heavy Artillery of the Army in France." "Military Intelligence."

ITALY.—*Rivista di Artiglieria e di Genio.* Rome: March, 1907 — "On the Determination of the Probable Error in Coast Range-Finders, with special reference to Vertical Base Instruments." "The New Tendencies of Siege Tactics and Previously Calculated Artillery Fire." "The Identification of Targets in Coast-Defence Batteries." "The French and Italian Regulations as to Buildings in Armoured Concrete." "The Piedmontese Fortrees Artillery in the Campaign of 1848-49."

Rivista Militare Italiana. Rome: March, 1907.—"Some Thoughts on Present Field Artillery Questions." "Over-sea Military Expeditions." "On Fighting with Modern Weapons." "The Conference of Conferences." "The Automatic Rifle and a Further Reduction of Calibre." "Some Remarks on the German Artillery." "A Regulation in need of Revision." "Joshua Carducci."

PORTUGAL. — *Revista de Engenharia Militar*. Lisbon: February, 1907.—“Use of a Light African Bridge for Field Service: Trials carried out at Tancoes, April, 1906” (concluded). “Remarks on the Report of Engineer Rego Lima on his Mission to the Mines of Cassinga in 1898” (continued). “On the Effects of the Detonation of Explosives” (continued). “Historical Documents: Circular of the Count of Lippe on the Attack and Defence of Fortified Places.”

Revista de Infanteria. Lisbon: April, 1907.—“Machine Guns” (continued). “On the Evolution of Infantry Tactics” (continued). “On Sergeants.” “An Infantry Raid in South Angola.” “Infantry Firing” “The Length of Service of Subalterns.”

Revista Militar. Lisbon: February, 1907. — “The Means to be Employed to Assure the Cavalry a Sufficient Number of Remounts and a Rapid Mobilisation.” “The Defensive System of Portugal in 1810, and the Lines of Torres Vedras.” “Infantry Portable tools.” “Mobilisation of Armies.” “The Austrian Navy.”

SPAIN.—*Memorial de Ingenieros del Ejército*. Madrid: March, 1907.—“Some Reflections on the Moorish Wells.” “The Eclipse of the Sun on the 30th August, 1905: *Resumé* of some of the Observations made.” “On Military Bibliography.”

Revista Técnica de Infanteria y Caballeria. Madrid: 1st April, 1907. “Military Science at Athens (Lectures by Colonel Marva): The Army in Intellectual Order.” “Military Exercises in Catalonia.” “Training in Moving in Square.” “Cavalry and Musketry Instruction.” “Our Soldiers in Africa.” “Studies on Infantry Tactics.” 15th April.—“A Trial of Ruling with a Gentle Hand.” “Military Exercises in Catalonia” (continued). “Our Soldiers in Africa” (continued). “Some Studies on Infantry Tactics” (continued). “After the Battle.”

Revista Científico Militar y Biblioteca Militar. Barcelona: April, 1907. — “Bases of our Military Organisation.” “The Occupation of Oudja.” “On General Obligatory Military Service.” “Infantry Firing in the Russo-Japanese War.” “Centenary of the Dragoons of Numancia.”

SWITZERLAND.—*Revue Militaire Suisse*. Lausanne: April, 1907.—“The Attack and Defence of a Fortified Field Position.” “Gymnastics in the French Army.” “Sore Feet.”

UNITED STATES.—*Army and Navy Life*. New York: April, 1907.—“1607-1907.” “Trophies of the Nation.” “Studies in the Psychology of War.” “The Regeneration of the Panol.” “The Line Bugbear.” “The Open Door.”

Journal of the United States Infantry Association. Washington: April, 1907.—“Infantry Drill Regulations, 1904.” “Football at the United States Military Academy.” “Recruitment and Instruction of Bandmen.” “The Fife and Drum for Infantry.” “Solution of Prize Problem No. 1.” “The Vicksburg Campaign, 10th January to 4th July, 1863.” “Reforms Needed in Skirmishing.” “Proposed new Skirmish Target.” “Rifle Practice.” “Infantry Instruction under the Provisions of G.O. 44, c.s., W.D., and G.O. 19 c.s., P.D.” “Some Observations Concerning Field Orders.” “General Remarks on Physical Training in the Service.” “Translations.” “Comment.”

NOTICES OF BOOKS.

Wellington's Campaigns, 1808-1815, and Moore's Campaign of Corunna.

By Major-General C. W. ROBINSON, C.B. 3 vols. London: Hugh Rees, Ltd. 1905-1906. Price, 3s. 6d. net per volume.

Major-General Robinson has now published the third and last volume of this series, and it may be said at once that the whole scheme and arrangement of his work is admirable. The author has compiled a most concise yet interesting account of all the main operations; he gives a very clear idea of the topography of the country, while each phase of the operations is accompanied by exhaustive critical observations, which cannot fail to be most instructive to the student for whom these studies are primarily intended.

The author's account of Moore's campaign is very short; but he certainly manages to do justice to the great soldier, who ran a great risk for a great end, and gives a clear picture of the conditions under which Moore's operations were carried out, and shows how all that was possible was accomplished. The account of the campaign in Belgium is not less well described, and especially valuable is the opening chapter, wherein the writer treats of the many conflicting views of its incidents, and points out the chief matters of discussion, now and in the past, showing how the literature and history of the campaign has grown up. He very rightly lays great stress upon a matter which students—and even instructors—do not always sufficiently realise, and that is that Ligny and Quatre Bras were actually but one battle-field, and that on the 16th June Wellington and Blücher “did act in concert, though not in actual touch; they did indirectly aid one another; and the result of Napoleon's attack was that he was beaten upon his left at Quatre Bras, and, though successful on his right at Ligny after a desperate battle, he was so severely handled there that his victory, weakly followed up, was inconclusive.”

The student has no lack of choice in the matter of text-books to assist his grasp of Wellington's campaigns; but General Robinson's three volumes are immeasurably the best of all those which have appeared of late, and their perusal and the study of their very clear and excellent maps, may be confidently recommended to all British officers.

Geography in Relation to War. By Colonel E. S. MAY, C.B., C.M.G.
London: Hugh Rees, Ltd., 1907.

Several of the lectures delivered at the last Conference of the General Staff at the Staff College have now been published, and Colonel May has been well advised to permit the one which he gave on a subject of supreme importance to be made available for minor students. Long before the War of Secession broke out, Sherman had written that “the knowledge of geography in all its branches is essential to a true military education,” but although three-fourths of a century have gone by since those words were penned, it may be questioned whether the study of

geography, and especially the study of geography in relation to war, has received at our hands all the attention which it unquestionably demands.

In this little book of barely sixty pages the subject of military geography is very admirably treated, and is enriched and made interesting by a very great wealth of illustrations drawn from numberless campaigns, ancient and modern, while even humour—a vanishing virtue among latter-day educational lecturers—is not altogether wanting. Colonel May's book will certainly be welcomed by a wider circle than that to which his lecture was in the first instance addressed.

A Staff Officer's Scrap-Book. Vol II. By Lieut.-General Sir IAN HAMILTON, K.C.B. London: Edward Arnold. 1907.

It is a matter for very real congratulation that Sir Ian Hamilton has been able to redeem the half promise he made us last year, and publish a second instalment of the intensely fascinating and sympathetic narrative of all that he witnessed of the war in Manchuria while attached to the staff of the First Army under Kuroki. The first volume began with an account—gleaned from eye-witnesses and actors—of the battle of the Yalu, and closed with that of Yoshirai. In the book under review, General Hamilton describes, in picturesque yet vigorous language, the prolonged and terrible fighting at Liao-yang and at the Sha-ho. In both books we have the writer's impressions served up fresh from the battle-field; in the second, more particularly, we learn much of the horror and still more perhaps of the grandeur and glamour of modern war, while we are helped to an appreciation of the real significance of every move by means of Sir Ian Hamilton's own well-considered comments and by the information so freely placed at his command by the staff of the First Army. The result is a narrative of singular attraction, full of immense technical interest to the soldier, and replete with a very human interest to the ordinary reader.

There is a delightful chapter at the very beginning of the book, wherein the writer sets out his thoughts on the Japanese, and emphasises the difficulty of forming a just analysis of their character; he discusses their modesty after victory, wherein he seems to detect a pride which refuses to consider even the possibility of defeat; he finds that their extraordinary courage is "not precisely a counterpart of Western valour. There is some philosophy and passivity about it; more conscious self-sacrifice; less Berserker joy of battle, and longing to do some glorious act. All Japanese soldiers go into battle expecting and prepared to conquer and die; brave British soldiers go into battle hopeful and prepared to conquer or die." General Hamilton speaks of the Japanese soldier's disdain for pelf, and the curiously lower standard of the Japanese civilian. He points the lesson we British may learn from Japan: "The greatest quality any nation can possess, the power, namely, of imbuing its sons and daughters with the idea that the public interest comes first and the private interest comes a long way second. . . . Too often with us is the noble word freedom degraded by being confused with the right of the individual against the State."

To the majority of his readers, Sir Ian Hamilton will possibly seem at his best in his vivid descriptions of scenes he has witnessed of passion and savagery—the fighting for the possession of the insignificant hillock of Mariguyama and the stricken field as he saw it: "a mad jumble of arms and accoutrements, mingled with the bodies of those who so lately bore them, arrested, cut short in the fury of their assault, and now, for all their

terrible, menacing attitudes so very, very quiet"; the desperate fighting in the dark on the night of the 1st September, with the shapes of the hills outlined by the rifle fire; the capture of Terayama by the Okasaki Brigade; the final rush, as dawn is breaking, upon Standard Hill; and the assault of the Tall Hill. These and other living pictures, drawn by a master hand, may be found on almost every other page—scenes of desperate fighting, wherein ample justice is done to the "astonishing infantry" of both armies.

Not the least interesting part of the book to a soldier, because wholly novel, is that where the writer tells us of the characteristics and attributes of the Japanese commander and of his staff, and of the relations between the two; and Sir Ian wonders what will happen when the present staff officers become commanders; the indifference of the Japanese Army to the personality of the leaders; and General Hamilton's expressed belief that if "a Russian Skobeloff were now to appear upon the scene—brilliant, swift, daring—adored by his troops, and possessing the true imaginative instinct," the Japanese might find "that there was an element in Western warfare with which they have not yet been called upon to count."

It is impossible in the space at disposal to convey any adequate idea of the genuine attractiveness of this book, of the charm of its literary style, of the value of the criticisms of the operations therein described, of the lessons which the book as a whole conveys of the true meaning and complexity of war—the preparation and the strain; all those should read it among whom there exists "atrophied perhaps, but still living, a sense, a sentiment, a memory, which vibrates to the stirring sound of the call to arms." Acknowledgment, too, must be given to Captain Vincent, whose sketches are altogether admirable, and Sir Ian Hamilton must be considered fortunate to have secured that officer's aid in the apt illustration of the most strikingly dramatic and valuable account which has yet appeared of the great war in the Far East.

PRINCIPAL ADDITIONS TO LIBRARY, APRIL, 1907.

Training Manual—Signalling, 1907. Official. Demy 12mo. 6d. (Presented.) (Harrison & Sons.) London, 1907.

A Nation in Arms. By Field-Marshal Earl ROBERTS. Crown 8vo. 2s. 6d. (John Murray.) London, 1907.

The First and Second Battles of Newbury and the Siege of Donnington Castle during the Civil War, A.D. 1643-46. 2nd Edition. By WALTER MONEY. Crown 8vo. 7s. 6d. (Simkin, Marshall & Co.) London, 1884.

A Year Among the Persians. By E. G. BROWNE. 8vo. 21s. (Adam & Charles Black.) London, 1893.

Information on the Battle-field. Aldershot Military Society. No. 93. By Brevet-Colonel J. E. CAPPER, C.B., R.E. 1907.

Manual of Sanitation in its Application to Military Life. Official. 8vo. 2d. (Harrison & Sons.) London, 1907.

Imperial Outposts. By Colonel A. M. MURRAY. 8vo. 12s. (John Murray.) London, 1907.

The Whirlpool of Europe. By A. R. COLQUHOUN and EDITH COLQUHOUN. 8vo. 15s. (Harper & Brothers.) London and New York, 1907.

La Préparation au Combat de l'Infanterie Allemande. By Le Commandant PALAT. 8vo. (Presented.) (Henri Charles-Lavauzelle.) Paris, n.d.

Emploi des Eclaireurs d'Infanterie pour les Préliminaires du Combat. By Le Général WARNET. 8vo. (Presented.) (L. Baudoin.) Paris, 1893.

Nouvelle Tactique de Combat. By Colonel H. DE PONCHALON. 8vo. (Presented.) (Henri Charles-Lavauzelle.) Paris, 1892.

Der Patronillendienst bei der Infanterie (Jäger) Truppe, mit besondere berücksichtigung der Meldedienstes. By Lieut.-Colonel E. VON GÄGER. 8vo. (Presented.) Trient, 1894.

Combates y Capitellación de Santiago de Cuba. By Don JOSE MÜLLER y TETJEIRO. 8vo. (Presented.) (Félice Marqués.) Madrid, 1898.

Etudes de Tactique Appliquée—L'Attaque de Saint-Privat, 18 Août, 1870. By P. LEHAUTCOURT. 8vo. (Presented.) (Henri Charles-Lavauzelle.) Paris, n.d.

Scouting and the Training of Scouts in Peace. By Lieutenant H. J. N. DAVIS, Connaught Rangers. Military Society of Ireland. Dublin, 1907.

To Authors, Officers, &c.

Mr. C. GILBERT-WOOD is open to give expert advice on the Publication of NAVAL AND MILITARY BOOKS, and also to undertake the Printing, Binding, and Publishing of same.

For terms, write or call :—

THE GILBERT-WOOD PRESS,

Dacre House and Granville House, Arundel Street, Strand, London, W.C.,
Or 'phone 4680 Gerrard, or wire to "Gilberwood," London.

ARMY TUTORS.

CAPTAIN GALL

AND

MR. GLADSTONE, M.A.

(Late Captain Gall)

(Oxon.)

90a, GLOUCESTER ROAD,
SOUTH KENSINGTON

Latest Successes—

MILITIA COMPETITIVE, 1906.

MARCH—Ten Candidates prepared.
ALL Successful.

(First Place, Artillery.)

OCTOBER — First Artillery, and First on
List, also 3rd, 11th, and 35th places taken.

ARMY QUALIFYING—

The Three Candidates prepared passed.

PROMOTION EXAMINATION—

The Officers who read here for the May
Examination were all successful.

ORDNANCE COLLEGE. 4th place taken.

PROMOTION, STAFF COLLEGE and
ORDNANCE COLLEGE.

Preparation

By Lectures or Correspondence.

WORK NOW GOING ON FOR ALL EXAMINATIONS.

SCHOOL OUTFITS

.. AT ..

Moderate Charges

Suits
Overcoats
Shirts
Underwear
Boots
Hats
Hose
Trunks, &c.

FROM

SAMUEL BROTHERS, LTD.,

65 & 67, Ludgate Hill, London, E.C.

ESTABLISHED SEVENTY YEARS.

Assortments forwarded on approval to any part of
the country.

Appointments kept in London & Suburbs free of charge.
Illustrated Catalogue and Patterns post free.

The "Wear-Resisting" Fabrics (Regd.)—Speciality
for Boys' Hard Wear

7th DRAGOON GUARDS.

The Historical Records of the 7th
(Princess Royal's) Dragoon Guards are
being re-written and will be brought out
quarterly in the Regimental Journal.

The Officer Commanding would be
much obliged for any material to assist
him in compiling this history.

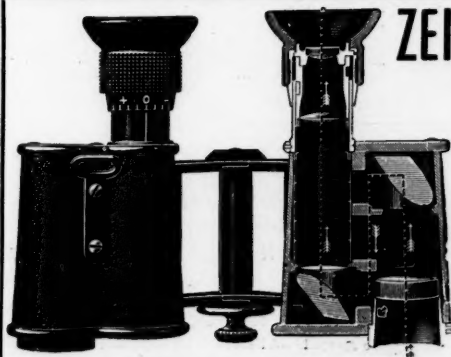
Help from any one in possession of
private letters or other documents relating
in any way to the Regiment, or photo-
graphs of portraits of Officers who have
belonged to the Regiment will be grate-
fully accepted and the greatest care taken
of them.

Letters should be addressed to—

The OFFICER COMMANDING.

7th Dragoon Guards,

Cavalry Barracks, Canterbury.



ZEISS FIELD GLASSES

WITH ENHANCED STEREOSCOPIC EFFECT.

x 6, £6 0 0 x 8, £6 10 0

Special Types for Hunting, Marine Work, &c.

Illustrated Catalogue "Tj." post free on
application.

CARL ZEISS, JENA.

BRANCHES:

LONDON, 29, MARGARET STREET,
REGENT STREET, W.

Berlin, Frankfurt a.m., Hamburg, Vienna,
St. Petersburg



The Journal of the Royal Artillery.

THIS Journal, which was formerly known as the "Proceedings" of the R.A. Institution, contains articles and information on Artillery matters, some highly technical and some general. Articles on general Military topics also appear.

In the Translations and Précis, which are an important feature, an attempt is made to keep up with the progress of Artillery on the Continent.

All members of the Royal Artillery Institution receive the Journal.

Any officer serving in the Navy, Army, Militia, Imperial Yeomanry, Volunteers and Colonial Permanent Forces can receive this Journal post free on application to the Secretary, R.A. Institution, at an annual subscription of 20s.

WOOLWICH: ROYAL ARTILLERY INSTITUTION.

Single Copies, price 2s. 6d. each, postage extra.

Sole Advertisement Contractor, Mr. C. Gilbert-Wood, Dacre House and Granville House, Arundel Street, Strand, W.C.

Telegrams:—"GILBERWOOD, LONDON." Telephone:—4680 Gerrard.

THE



Cavalry Journal

Published with the sanction of the Army Council and under the direction of Major-General R. S. S. BADEN-POWELL, C.B., Inspector of Cavalry in Great Britain.

Published Quarterly, Price 2/6 net. Postage 4d.

NOW READY. VOL. 2. No. 6.—APRIL, 1907. NOW READY.

CONTENTS.

Coloured Frontispiece—"Charge of the 5th Lancers at Elandslaagte."
Modern Discipline and How to Get It. By Maj. Gen. BADEN-POWELL, C.B.
St. George, the Patron Saint of England and of Chivalry. (Illustrated). By Major H. G. PURDON, late Loyal North Lancashire Regiment.
Individual Initiative. By Lieut. D. OSMUND-WILLIAMS, 18th Hussars.
The Horse's Mind. By Major N. BIRCH, R.H.A.
Cavalry Exploits. General Lake's Pursuit of Holkan. (Illustrated). By Major G. F. MACMUN, D.S.O., R.F.A.
The Cavalry School Staff Ride. (With Map). By Brig. Gen. E. C. BETHUNE, C.B.
Scouting Notes. By Major G. REYNOLDS, D.S.O., 3rd Dragoon Guards.
An Early System of Signalling. (Illustrated).
The New Organisation for Field Service.

Education in Relation to the Army. (With Maps) By Sir G. ARTHUR, late 2nd Life Guards.
The Long Distance Ride of the Japanese First Cavalry Brigade.
New Functions for Cavalry Work.
Austrian Views on Cavalry Work.
A Neglected Warning in Russia.
German Cavalry and the Lessons of the Russo-Japanese War.
The Royal Artillery Riding Establishment. (Illustrated). By Lieut. W. N. KIRBY, R.H.A.
"Cavalry in Future Wars."
"A Staff Officer's Scrap Book."
Recent Publications.
• A Suggestion on the Question of Station Veterinary Hospitals. By Major E. K. ANSELL.
Notes.
Sporting Notes.

SUBSCRIPTIONS should be sent direct to:—

The Managing Editor at

**THE ROYAL UNITED SERVICE INSTITUTION,
WHITEHALL, LONDON, S.W.**

or Copies may be obtained by ALL Booksellers, Newsagents and Railway Booksellers, from

**THE GILBERT-WOOD PRESS,
3 & 5, ARUNDEL STREET, STRAND, LONDON, W.C.**

Telephone Nos. 4680 & 4680A GERRARD.

Telegraphic Address:—"GILBERWOOD, LONDON."

THE RISE AND DECLINE OF THE NETHERLANDS.

A Political and Economic History and a Study in Political
Statesmanship.

By J. ELLIS BARKER, Author of "Modern Germany," &c.

SOME PRESS OPINIONS.

Mr. J. L. GARVIN, in *The Fortnightly Review*, says:—"There is nothing in any language like it, and when all is said, it remains one of the most striking additions recently made to the political library. . . . The work is a mine, and not the least merit of Mr. Barker's pages is that he supplies an exhaustive index, which is a model of its kind."

The National Review says:—"Among recent publications of particular interest to our readers we may note 'The Rise and Decline of the Netherlands.' We only wish that every Member of Parliament could be compelled to read it."

The United Service Magazine says:—"Mr. Barker has written an exceedingly valuable book, which deserves to be studied with the utmost care."

The National Service Journal says:—"A story which every Englishman should read and ponder well the lesson which it bears for his own countrymen."

The Contemporary Review says:—"A very full and interesting account of the early struggles of the Dutch, and the wonderful way in which they drew their country out of the sea."

The Standard, under the heading of "An Imperial Object Lesson," says:—"Its interest and importance for British readers could hardly be exaggerated. No British subject of ordinary intelligence can read it without drawing the most valuable and necessary of all lessons from it."

The Daily Telegraph says:—"A strong, attractive and impressive volume, which may be read by everyone who has a sense of the proper responsibilities of citizenship."

The Morning Post says:—"Mr. Barker's ideal of Imperial unity and Imperial defence are of great practical importance to us, and his book may be read with advantage by all interested in the welfare of our Empire."

The Pall Mall Gazette says:—"Every need exists for the very careful study of the lessons to Great Britain which may be found in the rise and decline of this neighbouring State."

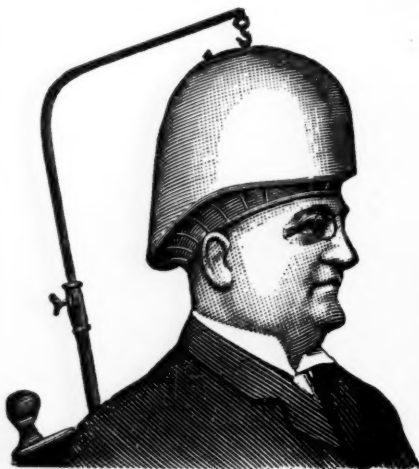
The World says:—"Mr. J. Ellis Barker addresses a warning to England lest she experience the same fate as has befallen Holland. . . . His work is distinctly interesting, and it must be hoped that his warning will not fall on dull and heedless ears."

The Globe says:—"A work of remarkable power, and should compel the close attention of statesmen."

The Manchester Courier says:—"Never was taught a more opportune lesson, and if this volume were read and digested by every elector, who at present appears to be under the influence of plausible, cheeseparing demagogues, the good effect of the book would be invaluable."

The Yorkshire Post says:—"This book should be read from preface to conclusion with an open mind. . . . There is much in the volume which deserves the most thoughtful study."

London: Smith, Elder & Co., 15, Waterloo Place, London, S.W.



A
**REMARKABLE
 INVENTION**
 FOR THE
**CULTURE
 OF HAIR**

THE EVANS VACUUM CAP is a practical invention constructed on scientific and hygienic principles by the simple means of which a free and normal circulation is restored throughout the scalp. The minute blood vessels are gently stimulated to activity, thus allowing the food supply which can only be derived from the blood, to be carried to the hair roots, the effects of which are quickly seen in a healthy, vigorous growth of hair. There is no rubbing, and as no drugs or chemicals of whatsoever kind are employed there is nothing to cause irritation. It is only necessary to wear the Cap three or four minutes daily.

60 DAYS' FREE TRIAL !

The Company's Guarantee.

An EVANS VACUUM CAP will be sent you for sixty days' free trial. If you do not see a gradual development of a new growth of hair, and are not convinced that the Cap will completely restore your hair, you are at liberty to return the Cap with no expense whatever to yourself. It is requested, as an evidence of good faith, that the price of the Cap be deposited with the Chancery Lane Safe Deposit Company of London, the largest financial and business institution of the kind in the world, who will issue a receipt guaranteeing that the money will be returned in full, on demand without questions or comment, at any time during the trial period.

The eminent Dr. I. N. LOVE, in his address to the Medical Board on the subject of Alopecia (loss of hair) stated that if a means could be devised to bring nutrition to the hair follicles (hair roots) without resorting to any irritating process, the problem of hair growth would be solved. Later on, when the EVANS VACUUM CAP was submitted to him for inspection, he remarked that the Cap would fulfil and confirm in practice the observations he had previously made before the Medical Board.

Dr. W. MOORE, referring to the invention, says that the principle upon which the Evans Vacuum Cap is founded is absolutely correct and indisputable.

An illustrated and descriptive book of the Evans Vacuum Cap will be sent, post free, on application.

**THE SECRETARY, EVANS VACUUM CAP CO., LIMITED,
 REGENT HOUSE, REGENT ST., LONDON, W.**

TWO INTERESTING BOOKS.

"RAIDS."

Price 1/- net; Post Free, 1/2.

"CONSCRIPTION AVOIDED."

Price 1/- net; Post Free, 1/2.

LORD ROBERTS says:—

"All interested in the Defence of this Empire should read these important books."

**LONDON: THE GILBERT-WOOD PRESS,
3 & 5, Arundel Street, W.C.**



THE ROYAL ENGINEERS JOURNAL.

This Journal contains Articles on engineering matters, both military, technical and civil, and on general military topics. Transcripts and Notices from the technical publications of Foreign Armies are also contributed.

The Journal is issued free to all Members and Associate Members of the Royal Engineers Institute. All officers of the Royal Engineers (Regulars) serving and retired, are eligible for membership. The following may be Associate Members: Officers of the Royal Artillery, of the Home Militia and Volunteer Engineers; and of the Permanent, Militia, and Volunteer Engineers of all the Colonial Forces.

MONTHLY: PRICE 1s. 6d. Nett.

London:

C. GILBERT-WOOD, Arundel Street, W.C.

Chatham:

THE ROYAL ENGINEERS INSTITUTE.

An Expert Opinion of the

BUSCH 'TERLUX'

PRISM BINOCULAR.

3 TIMES MORE
LIGHT.

**The Best Glass for Military
and Naval Officers.**

**For use in various Climates
on dull as well as fine days
Winter and Summer.**



Admiral Lord Charles Beresford's opinion:

"Lord Charles has been looking through a pair of Busch Glasses which had engraved on them, PRISMA BINOCLE 'TERLUX'; Lord Charles during his long experience at sea has never before looked through so good a pair of Glasses."

AND LATER:—H.M.S. "Bulwark," Mediterranean, August 20th, 1906.

"DEAR SIRS,—I have a pair of your Prism Binoculars and they are certainly far the best Glass I have ever used."—Yours faithfully,
CHARLES BERESFORD, Admiral.

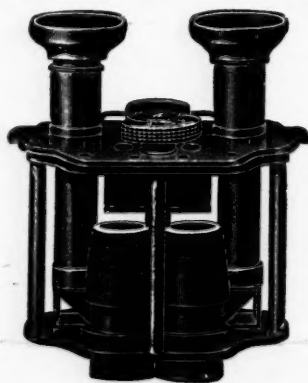
OF ALL OPTICIANS.

EMIL BUSCH OPTICAL CO., 35, CHARLES STREET, HATTON GARDEN, LONDON, E.C.

DALLMEYER'S NEW PRISMATIC BINOCULARS

**"The
Service."**

For Naval and
Military Officers
and
Sportsmen.



For
Travellers,
Naturalists,
and for
Theatre use.

Patent.

Showing "Service" Binocular with outer cover removed for cleaning prisms.

LIGHTNESS.—They weigh about 2 oz. less than any other glasses of similar power.

DURABILITY.—Prisms fixed in rigid frame can be easily adjusted if necessary, although it is practically impossible for them to get out of alignment.

CONVENIENCE.—Can be focussed, adjusted, &c., while holding in one hand.

Illustrated Booklet Free on application.

J. H. DALLMEYER, Ltd., 25, Newman St., London, W

A choice of Cocoa to suit your taste.
Either the most nutritious
and strength-giving

EPPS'S
Grateful—Comforting.
COCOA

A delicious drink and
a sustaining food.

Or, a lighter and thinner
drink, refreshing and stimulating.

EPPS'S
COCOA
ESSENCE

Welcome at any hour
of the day.

MR. MURRAY'S NEW MILITARY WORKS.

CAVALRY IN FUTURE WARS.

By His Excellency Lt.-General FREDERICK VON BERNHARDI, Commander of the 7th Division of the German Army. Translated by CHARLES SYDNEY GOLDMAN, Editor of "The Empire and the Century." With an Introduction by Lt.-General SIR JOHN FRENCH, K.C.M.G., K.C.B., G.C.V.O. Demy 8vo. **10s. 6d.** net.

EXTRACTS FROM SIR JOHN FRENCH'S INTRODUCTION.

"The Author of this book is an eminent soldier, possessing an intimate knowledge of practical fighting.

"His opinions are entitled to profound respect and demand close attention and consideration. The General has treated his subject, and marshalled his arguments and statements in so logical and intelligent a manner, and the principles he deduces seem so sound and appropriate, that the conclusions he arrives at appear to me unanswerable.

"Personally, I have never known the 'Case for the Cavalry' stated more clearly and intelligently.

"With remarkable perspicuity and telling conviction, General von Bernhardt has dealt in an exhaustive manner with every subject demanding a Cavalry soldier's study and thought. I am convinced that he who thoroughly masters the contents of his book will feel no doubt, and will entertain no misapprehension as to the vast rôle his Arm is called upon to fulfil in War."

IMPERIAL STRATEGY.

By the MILITARY CORRESPONDENT OF "THE TIMES." With Maps. Medium 8vo. **21s.** net.

"The admirable volume should stand upon the shelf of every soldier, and of every thinker upon Imperial things."—*Army and Navy Gazette*.

"The book is illustrated with maps, and is crammed with information of the most valuable kind."—*United Service Gazette*.

"The book is a most valuable and timely aid to the cause of national security, and should be read by all those who are in a position to influence the destinies of the Empire."—*Morning Post*.

THE ARMY IN 1906.

A Policy and a Vindication. By the Right Hon. H. O. ARNOLD-FORSTER, M.P. Demy 8vo. **12s.** net.

THE TRAGEDY AND COMEDY OF WAR HOSPITALS.

Described from Personal Experiences during the South African War. By SISTER X. With Illustrations. Square Demy 8vo. **6s.** net.

JOHN MURRAY, Albemarle Street, W.

Connoisseurs of **COFFEE**
 DRINK THE
RED
WHITE
& BLUE.

DELICIOUS FOR BREAKFAST & AFTER DINNER.
 In making, use LESS QUANTITY, it being much stronger than ordinary COFFEE.

SEWAGE PURIFICATION.
The SEPTIC TANK System.
 For MANSIONS, COUNTRY HOUSES,
 VILLAGES and TOWNS.
 EXTENSIVELY ADOPTED BY H.M. WAR OFFICE.
 THE SEPTIC TANK Co., LTD., 1, VICTORIA STREET, WESTMINSTER.

JEROME SACCONI, LTD.,
GIBRALTAR.
 33, Railway Street, CHATHAM; and 6, Bank Buildings, Elm Grove,
 Southsea, PORTSMOUTH.
 Wine, Spirit and Cigar Merchants to the Army and Navy.

Price Lists and Samples on application.
 Wines shipped **FREIGHT FREE** to any Port in the Mediterranean or
HALF FREIGHT TO INDIA and the Cape.

Telegraphic Addresses:—
 "SACCONI, GIBRALTAR"; "SACCONI, CHATHAM"; "SACCONI, PORTSMOUTH."

Estd. **C. GILBERT-WOOD,** *1894.*
 Newspaper Proprietor, Publisher, Lithographic & Letterpress
 Printer, Advertisement Contractor, etc.

Sole Advertisement Contractor for:—

"The Cavalry Journal,"	"The Royal Engineers Journal,"
"The Royal Navy List,"	"The Journal of the Royal Artillery,"
"The Journal of the Royal United Service Institution,"	"The Gibraltar Directory,"
"The Indian Volunteer Record,"	"The Naval Handbook,"
"The Journal of the United Service Institution of New South Wales,"	"The Naval and Military Review,"
	"The Naval Pocket Book,"
	"Fighting Ships," etc., etc.

Dacre House and Cranville House, Arundel Street, Strand, LONDON, W.C.
 TELEPHONES:—4680 Gerrard; 4680A Gerrard; 92 Holborn;
 Registered Telegraphic Address: "GILBERWOOD, LONDON."

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT-WOOD'S ADVERTISING
 OFFICES, DACRE HOUSE, ARUNDEL STREET, STRAND, LONDON, W.C., WHERE ALL
 COMMUNICATIONS SHOULD BE ADDRESSED.
 TELEPHONE No. 4680, GERRARD.

